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BRITISH BIRDS.

VOL. IV.

NEW YORK,
OF NATURAL HISTORY.

A HISTORY OF BRITISH BIRDS.

BY

WILLIAM YARRELL, V.P.L.S., F.Z.S.

FOURTH EDITION, IN FOUR VOLUMES.

ILLUSTRATED BY 564 WOOD-ENGRAVINGS.

VOL. IV., REVISED AND ENLARGED

BY

HOWARD SAUNDERS, F.L.S., F.Z.S., Etc.

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BRITISH BIRDS.

TUBINARES. *PROCELLARIIDÆ.*

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PAGE	LINE	
3,	28,	*for* seem *read* seems.
13,	6 and 11,	*for* Dusky *read* Sooty (Shearwater).
19,	36,	for *tristris* read *tristis*.
34,	20,	for *Æstrelata* read *Œstrelata*.
74,	1,	*for* p. x. *read* p. 186.
95,	2,	*for* smaller *read* larger.
125,	20,	*for* four *read* five.
157,	15,	*for* F. *read* T.
166,	28,	*dele* Spixworth, where the nests are in Portugal laurels.
175,	5,	*for* Alfred *read* Philip.
193,	13,	*for* before the 10th of June *read* before the last week in May.
221,	16,	*for* Poole *read* Christchurch.
240,	8,	*for* Alfred *read* Philip.
248,	12,	*for* Lower Middle Tertiary *read* Lower and Middle Tertiary.
267,	10,	*for* Yenesei *read* Petchora.
306,	8,	for *ruepelli* read *rueppelli*.
370,	18,	*for* Garganey *read* Gadwall.

upper mandible, but united, enclosed, and somewhat hidden within a tube

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* *Procellaria glacialis*, Linnæus, Syst. Nat. Ed. 12, i. p. 213 (1766).

† Shaw's General Zoology, xiii pt. i. p. 233 (1825).

ANSERES—*continued.*

Anatidæ—*continued.*

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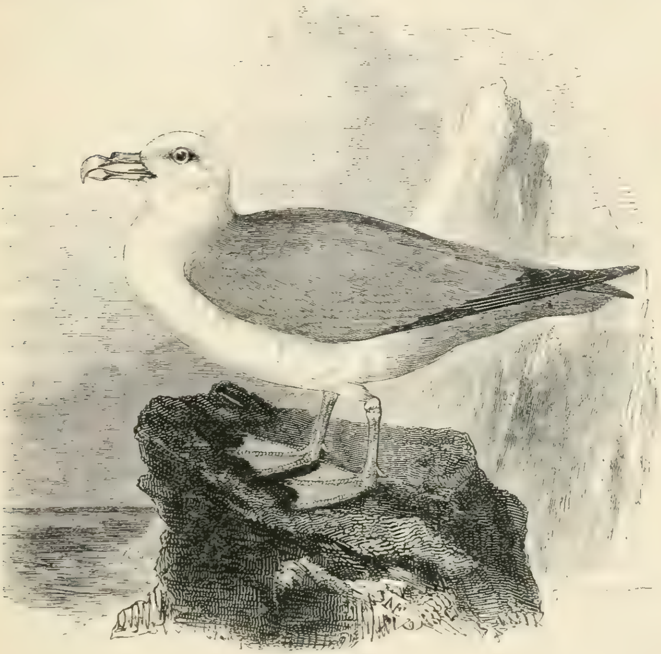
BRITISH BIRDS.

TUBINARES. *PROCELLARIIDÆ.*



FULMARUS GLACIALIS (Linnæus*).

THE FULMAR PETREL.

Procellaria glacialis.

FULMARUS, *Stephens*†.—Beak not so long as the head; the upper mandible composed of four portions, divided by lines, or indentations; the whole together large and strong, curving suddenly towards the point; the under mandible grooved along each side, bent at the end, with a prominent angle beneath; the edges of both mandibles sharp and cutting; those of the lower mandible shutting just within those above. Nostrils prominent along the upper ridge of the upper mandible, but united, enclosed, and somewhat hidden within a tube

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[*] *Procellaria glacialis*, Linnæus, Syst. Nat. Ed. 12, i. p. 213 (1766).

[†] Shaw's General Zoology, xiii pt. i. p. 233 (1825).

with a single external orifice, within which the division between the two nasal openings is visible. Tarsi compressed, feet moderate ; three toes in front united by membranes, hind toe rudimentary, with a conical claw. Wings rather long, the first quill-feather the longest in the wing.

THE family of the Petrels or TUBINARES was in former Editions associated with the *Laridæ*, but a better knowledge of their structure—due mainly to the investigations of the late Professor Garrod, and the late Mr. W. A. Forbes—has proved that, from an anatomical point of view, the grounds for such collocation are very slight. Whereas the Gulls are schizorhinal, the Petrels are holorhinal ; there are some important myological distinctions ; the character of the cæca is quite different ; moreover the eggs of the Petrels are white, and their young are helpless : in which, and in several other points, the Petrels approach the Storks, the American Vultures, and some of the *Steganopodes*. The Editor is, however, reluctant to change the previous arrangement more than is absolutely necessary, and he, therefore, retains the Petrels in their former position next to the Gulls, although the two families have little in common beyond their webbed feet and more or less pelagic habits.*

THE FULMAR PETREL is chiefly an autumn and winter visitor to the more southern parts of England, and even then the specimens obtained are chiefly birds which have been driven to our coasts by tempestuous weather. Under such circumstances they have been known to occur far inland, and as they are incapable of rising from a flat surface, examples have been captured alive. But although rare, even on the east coast from Northumberland to Essex, they are by no means uncommon at times on the fishing-grounds about thirty miles out, and when the herring-nets are being hauled the voracity of the Fulmars is so great that they are sometimes taken by hand. Stragglers have also been obtained along the south and west coasts as far as Devon, Cornwall, and Somerset, and sometimes, though not often, off Wales and the north-western counties.

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* The late Professor Garrod proposed to divide the *Tubinares* into two groups, the *Procellariidæ* and the *Oceanitidæ*, and these opinions are confirmed by Mr. Forbes, whose views are fully stated in his 'Report on the Voyage of H.M.S. Challenger,' Zoology, Vol. IV. Pt. xi. ; see especially pp. 54-64.

To Ireland the Fulmar is considered to be a still rarer visitor, and Thompson only records three examples, namely, one at Inchidoney Island, one near Dublin, and one near Cork; but possibly this may be owing to the absence of observers, for Mr. R. Warren has obtained, or found dead, no less than eight examples, on the sands at the Estuary of the Moy. His attention was attracted to two of these by the attempts of a Great Black-backed Gull to kill and devour them in their water-logged and enfeebled condition after heavy weather.

On the eastern shores of Scotland, according to Mr. R. Gray, this species occurs in winter, being frequently cast up by the sea or obtained in an emaciated condition. Its breeding-quarters are St. Kilda, Soa, and Borrera, from which group of rocks it is a straggler in the summer season to the Outer Hebrides; and it has been erroneously stated to nest in Skye. In the Shetlands the Fulmar was only known as a visitor until the 4th of June, 1878, when about a dozen pairs were observed hovering round the cliffs of the island of Foula, where they reared their young in some places in which, according to the natives, no birds had ever bred before. The nests were placed on small ledges formed by the splitting of the rocks into layers, while the entire cliff seemed so perpendicular that no foothold could be got for even the smallest bird. The next year about double the number of birds returned to the same quarters on Foula, and the species seem to be increasing there (Zool. 1879, p. 380).

The following account was given in the Edinburgh New Philosophical Journal by Mr. John Macgillivray, who visited St. Kilda in June, 1840:—" This bird exists here in almost incredible numbers, and to the natives is by far the most important of the productions of the island. It forms one of the principal means of support to the inhabitants, who daily risk their lives in its pursuit. The Fulmar breeds on the face of the highest precipices, and only on such as are furnished with small grassy shelves, every spot on which, above a few inches in extent, is occupied with one or more of its nests. The nest is formed of herbage, seldom bulky, generally a mere shallow excavation in the turf, lined with dried grass, and the withered tufts of the sea-pink, in which the bird deposits a single egg, of a pure white colour when clean, which is seldom the case, and varying in size from two inches seven lines to three inches one line in length by two inches in breadth.* On the 30th of June, having partially descended a nearly perpendicular precipice, six hundred feet in height, the whole face of which was covered with the nests of the Fulmar, I enjoyed an opportunity of watching the habits of this bird, and describe from personal observation. The nests had all been robbed about a month before by the natives, who esteem the eggs of this species above all others. Many of the nests contained each a young bird a day or two old at farthest, thickly covered with long white down. The young birds were very clamorous on being handled, and vomited a quantity of clear oil, with which I sometimes observed the parent birds feeding them by disgorging it. The Fulmar is stated in most works on ornithology to possess the power of ejecting oil with much force through its tubular nostrils, using this as a mode of defence; but although I surprised several upon the nest, I never observed them attempt this. On being seized they instantly vomit a quantity of clear amber-coloured oil, which imparts to the whole bird, its nest and young, and even to the rock which it frequents, a peculiar and very disagreeable odour. Fulmar oil is among the most valuable productions of St. Kilda. The best is obtained from the old bird. The Fulmar flies with great buoyancy and considerable rapidity, and when at sea is generally seen skimming along the surface of the waves at a slight elevation, though I never observed one to alight, or pick up anything from the water."†

Before proceeding further, it will be convenient to state that in the Fulmar there appear to be two distinct phases of plumage, analogous, perhaps, to the light and the dark forms observed in some of the Skuas. The ordinary adult bird has a slate-grey mantle with white head, neck, and underparts; but a considerable number of individuals are of an entirely ash-grey tint: the head, neck, and underparts being only a shade lighter than the mantle. The latter plumage has been generally assumed and even positively stated, to be that of the immature bird, but such is not necessarily the case. The Editor is indebted to Mr. E. Hargitt for two fledged young birds taken on Myggenæs in the Færoes, in the month of August, 1876, with patches of down still adhering, and their underparts are quite as white as those of the adult: in fact, but for the greater freshness of the unworn feathers of the mantle, and the weaker bill, the young are like their parents. Mr. L. Kumlien, naturalist to the American Polar Expedition of 1877-78, states that in July he found a few of these dark-coloured birds breeding on some small rocky islands in Cumberland Sound. He adds that more dark birds were seen in spring than in autumn, and that they predominate along the western shores of Davis Strait and Baffin Bay; but on Blue Mountain, Ovifak, Greenland, where the Fulmars breed in myriads to the very summit, about 2,000 feet high, he saw but few dark birds, the fledged nestlings being white on the underparts. Major Feilden was told by Mr. Fencker, of Godhavn, that the dark birds were called by the natives 'Igarsok,' a word meaning 'cook,' because that functionary on board the Danish trading-vessels usually dresses in a blue jersey (Zool. 1878, p. 376); he also observed that the light-breasted birds domineered over the dark ones; and so far as the Editor can judge from the limited series available, the dark birds are on the average somewhat smaller. There are, however, gradations in colour connecting the two extremes.

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* Average 2·9 by 2 in. The shell, which is rough, and pervaded by a strong musky odour, is sometimes minutely freckled with rusty red.

† A more recent account is given by Capt. H. J. Elwes in 'The Ibis,' 1869, pp. 32–35.

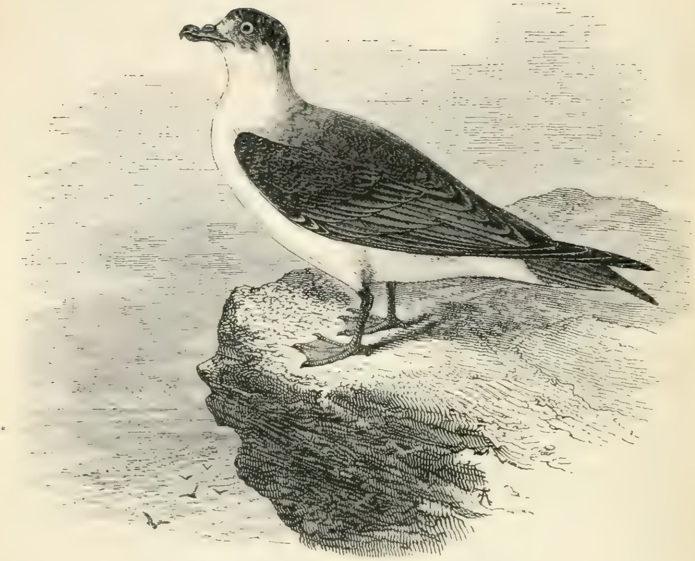
In the Færoe Islands the Fulmar made its first appearance as a breeding species about the year 1839, and it has since become common there. On the coast of Scandinavia it is only observed between autumn and spring, except, perhaps, to the north of the Arctic circle; and in the Baltic it is only a straggler. Its winter range is known to extend as far south as the Mediterranean, a specimen having been obtained at Cette on the 18th of December, 1860. In Iceland it is one of the commonest of birds, it being stated that from twenty to thirty thousand young Fulmars are annually caught on the Vestmanneyjar Islands to the southward, and Mr. Proctor observed that it was common at Grimsey, where the dark grey form is said to predominate. It is found in abundance in the Greenland Seas, Davis Strait, and Baffin Bay; and up Smith Sound two were observed by the 'Alert' explorers in 82° 30′ N. lat. Round Spitsbergen both forms are very numerous, and the light one breeds in thousands on some of the islands; also, in less abundance, on Novaya Zemlya; but its continuous range cannot as yet be traced along the coast of Arctic Siberia. In Bering Sea and the North Pacific are found two forms of questionable specific distinctness, *F. pacificus* and *F. rodgersi*, which also display the grey phase of plumage, and one of these, or else our Fulmar, occurs on Prince Albert Land. On the Atlantic seaboard the winter range of the Fulmar extends to Massachusetts.

Scoresby, in his account of the Arctic Regions, has given a long account of this species, part of which is as follows:—"The Fulmar is the constant companion of the whale-fisher, joining his ship immediately on passing the Shetland Islands, and accompanying it to the highest accessible latitudes. It keeps an eager watch for anything thrown overboard; the smallest particle of fatty substance can scarcely escape it. Fulmars are remarkably easy and swift on the wing, flying to windward in the highest storms, and resting on the water in great composure in the most tremendous seas; but it is observed that in heavy gales they fly extremely low, generally skimming along by the surface of the water. They are extremely greedy of the fat of the whale, and though few should be seen when a whale is about being captured, yet, as soon as the flensing process commences, they rush in from all quarters, and frequently accumulate to many thousands in number. They then occupy the greasy track of the ship; and being audaciously greedy, fearlessly advance within a few yards of the men employed in cutting up the whale. It is highly amusing to observe the voracity with which they seize the pieces of fat that fall in their way; the size and quantity of the pieces they take at a meal; the curious chuckling noise which, in their anxiety for despatch, they always make; and the jealousy with which they view, and the boldness with which they attack, any of their species that are engaged in devouring the finest morsels. When carrion is scarce, the Fulmars follow the living whale, and sometimes, by their peculiar motions when hovering at the surface of the water, point out to the fisher the position of the animal of which he is in pursuit. They cannot make much impression on the dead whale until some more powerful animal tears away the skin, for this is too tough for them to make way through it."

In the adult bird the curved point of the bill is yellow, the sides yellowish-white, the superior ridge investing the nostrils greenish; irides dark brown; a small dark spot in front of the eye; head and the neck all round white; the back, all the wing-coverts, secondaries, tertials, upper tail-coverts, and tail-feathers pearl-grey; wing-primaries slate-grey; breast, belly, and all the under surface of the body white: sometimes with a little grey on the flanks; legs, toes, and their membranes, pale grey in life, drying yellowish; the claws slender, but curved and pointed. The whole length of an adult male is about nineteen inches; the wing, from the anterior bend, twelve to thirteen inches; the middle toe and its claw longer than the tarsus.

In the grey phase the Fulmar has the tip of the bill yellow, the sides brownish-yellow, the sheath of the nostrils almost black; head, neck, back, wings, and tail nearly uniform ash-brown, but the surface of the back and wings rather darker in colour; chin, neck in front, and all the under surface of the body also uniform ash-brown, but rather paler in colour than the upper surface; legs and toes bluish horn-colour, membranes paler.

TUBINARES. *PROCELLARIIDÆ.*



ŒSTRELATA HÆSITATA (Kuhl[*]).

THE CAPPED PETREL.

Procellaria hæsitata.

ŒSTRELATA, *Bonaparte*[†].—Bill rather shorter than the head, stout, compressed, straight for some distance, then ascending at the commencement of the unguis, which is sharply decurved, with an acute tip ; nasal tubes moderately long, elevated, conspicuous, the dorsal outline straight, the orifice subcircular. Wings long and pointed, extending beyond the tail when folded ; the first quill a trifle longer than the second. Tail moderately long and graduated. Tarsi reticulated ; feet and front toes of moderate size ; hind toe small and elevated.

THE CAPPED PETREL represented above was observed in March or April, 1850, by a boy on a heath at Southacre, near Swaffham in Norfolk, flapping for some time from one furze-bush to another; at length it got into one of the bushes, and was then secured by him: exhausted as it was, it had strength enough remaining to bite violently the hand of its captor, who thereupon killed it. The late Mr. Newcome, of Hockwold Hall, near Brandon, fortunately happened at the time to be hawking in the neighbourhood of Swaffham, and his falconer, John Madden, observing the boy with the dead bird, procured it from him, and brought it to his master, by whom it was skinned and mounted, and in whose collection it found a place. A detailed account of this bird, with two illustrations, is given by Prof. Alfred Newton in 'The Zoologist' for 1852, p. 3691.

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[*] *Procellaria hæsitata*, Kuhl, Beit. Zool. i. p 142 (1820).

[†] *Æstrelata*, Bonaparte, Compt. Rend. xlii. p. 768 (1856). Amended to *Œstrelata*, the derivation being from *οἶστρος* (œstrus), a gad-fly.

In the Museum at Boulogne there is an example *said* to have been shot near that town many years ago by its donor, a sportsman long since deceased, and these are the only two instances on record of the occurrence of this species on the shores of Europe. Little is known of the distribution or head-quarters of this Petrel. In the British Museum there is a specimen from Hayti; and in Paris there are three examples obtained by L'Herminier, in the island of Guadeloupe.* Lafresnaye states, on his authority (Rev. Zool. 1844, p. 168), that there are two closely-allied species in that island, the one arriving towards the end of September, and breeding in the cliffs; the latter, and somewhat smaller species, arriving at a different time of year, and breeding in the same cliffs, but at a different elevation. The natives distinguish them as 'Petrels des hauts' and 'Petrels des bas.' One or both of these may, perhaps, be the 'Diablotin' of the natives, stated nearly two centuries ago by Père Labat to breed in holes in the mountains, especially in La Souffrière of Guadeloupe, and in Dominica; and it has been assumed that Labat's bird may be this species; but against this it must be said that Labat expressly states that his 'Diablotin' is black all over, and as such he figures it. Mr. F. Ober, who recently visited the above islands, and made expeditions to the mountains for the purpose of obtaining the 'Diablotin,' was unsuccessful. A bird referred by Dr. E. Coues to this species, but originally described by Mr. G. N. Lawrence (Ann. Lyc. N. York, iv. p. 474), under the name of *Procellaria meridionalis,* was found floating, wounded, on a salt lagoon on the eastern coast of Florida in the winter of 1846.

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* There is a fourth specimen in the Paris Museum, and one at Leiden, but the localities of their capture are not positively known.

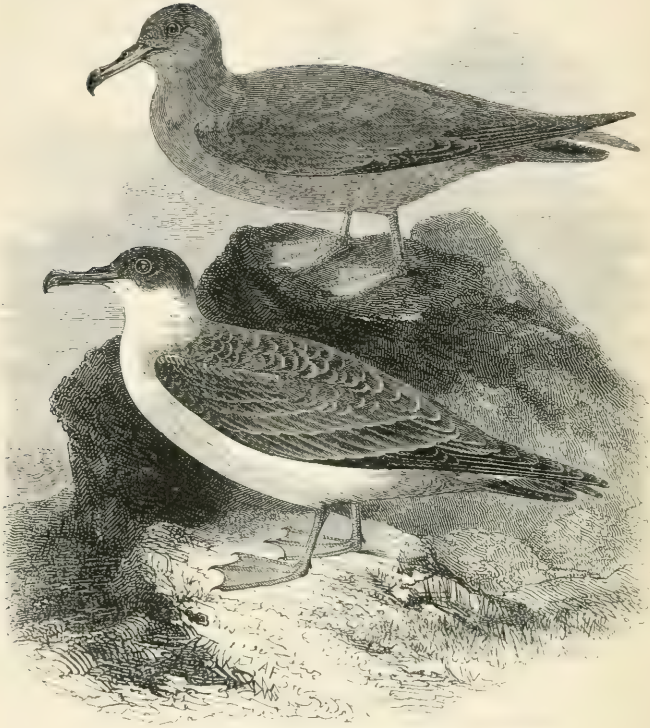
The following is the description, by Prof. Alfred Newton, of the apparently adult bird whose capture in Norfolk has procured for it a place in this volume:—" The whole of the beak is black: from the crown of the head to the nape of the neck the feathers are white at the base, broadly tipped with dark brown, so as to present, except at the edges of the patch, which is nearly circular, a uniform surface of the latter colour; in front and below the eye are a few greyish-black feathers extending over the ear-coverts; the orbits are surrounded with a ring of sepia-brown feathers. The forehead, face, neck, breast, belly, sides, and under tail-coverts are nearly pure white, but there are also a few dark feathers on the flanks. The back and shoulders are covered with brownish-grey and blackish-brown feathers, the former appearing to have been but lately assumed, but many of the latter are 'sedgy' and worn at the edges: all these feathers are white at the base, but that colour does not show on the surface. The rump and upper tail-coverts are white, the feathers of the latter elongated. The tail is rounded, and consists of twelve feathers, the outer pair white, edged and broadly tipped with blackish-brown, the next four pair are similarly coloured, but only slightly edged, the tips of each pair being darker as they approach the middle; the shafts of the quills in all these are white; the middle pair of quills are brownish-black nearly all their length, their basal being white, and have their shafts corresponding in colour to their webs. The wing-coverts are blackish-brown, bordered with a lighter shade of that colour, the borders of the middle and lower coverts being so broad as to appear like two light-coloured bars across the wing; the quill-feathers are blackish-brown, with shafts of the same, the first quill-feather being the longest; the under surface of the wings, as far as can be seen, is white. The naked parts of the tibiæ, the tarsi, and the basal halves of the toes and interdigital membranes appear to have been dusky-yellow, the rest of the feet and claws are black. Mr. Newcome tells me that the specimen was a female, and when fresh killed the irides were deep brown or hazel colour."

The whole length is sixteen inches: from the carpal joint to the end of the longest wing-feather rather more than twelve inches. The length of the naked portion of the tibiæ is rather more than half an inch; of the tarsus rather less than an inch and a half; length of the middle toe, without the claw, about one inch and three-quarters.

The bird in the British Museum, which is believed to be immature, has the crown and nape blackish-brown; the sides of the forehead white, marked with brown; hind neck, fore part of the face, entire throat and underparts white; back and upper parts dull brown, the margins of the dorsal feathers lighter; quills dark brown; tail dark brown, except at the base, where it is dull white, very much rounded in shape.

An example of the Petrel familiarly known as the Cape Pigeon (*Daption capense*), is recorded by Mr. A. G. More (Ibis, 1882, p. 346) as having been shot near Dublin on the 30th October, 1881; and it is stated by Degland and Gerbe that three specimens have been obtained in France. There does not, however, appear to be any adequate reason for including this species among the Birds of Great Britain, or even of Europe. Its home is essentially the southern hemisphere; and although it is known to follow ships, for the sake of food, for a considerable distance, yet it is equally certain that many birds, captured with hook and line, are then carried far beyond their usual area before being restored to liberty.

TUBINARES. *PROCELLARIIDÆ.*



PUFFINUS MAJOR, F. Faber*.

THE GREAT SHEARWATER.

Puffinus major.

PUFFINUS, *Brisson*†.—Bill rather longer than the head, slender, upper mandible compressed and curved towards the point; under mandible also slender and decurved at the point. Nostrils tubular, opening by two separate orifices. Legs of moderate length, tarsi compressed laterally; toes three in front, rather long, webbed throughout; hind toe rudimentary. Wings long and pointed, the first quill-feather slightly the longest. Tail graduated.

THE GREAT SHEARWATER, represented by the lower figure in the above illustration, is an irregular autumnal visitor to the British coasts, sometimes making its appearance in considerable numbers off the shores of Cornwall and the Scilly Islands. In the former Editions of this work it was confounded with its somewhat smaller congener, the Dusky Shearwater, *Puffinus griseus,* the upper figure in the plate; and this confusion having been general, and only recently dispelled, it is still very difficult to assign to their proper species many of the Shearwaters recorded from time to time under the name of *Puffinus major.* This difficulty is increased by the fact that the Dusky Shearwater, which is always of a sooty hue, was supposed to be merely the immature stage of *P. major.* The late Mr. D. W. Mitchell, then of Penzance, who furnished the Author with the birds of both species from which the figures here given were drawn, supplied in addition the following account of the appearance of this species on the coast of Cornwall:—"In November, 1839, a man brought me a *Puffinus major* alive, which he said he had found asleep in his boat when he went off to unmoor her, preparatory to a fishing expedition. I suppose this happened about three in the afternoon, and the bird had, probably, taken up his quarters at daylight. The moorings at Newlyn are from one hundred to two hundred yards from the shore. There were great numbers of this species off Mount's Bay at that time, and I soon after had two more brought to me, which had been taken by hooks. One of them is the light-coloured specimen in your collection. The dark-coloured bird which you have figured [*P. griseus*], was, I believe, obtained in a similar manner about the same period in 1838. It is the only example in that state which I met with during my residence in Cornwall. The adult bird appears pretty regularly every autumn, though not always in equal numbers. It has long been in several collections at Plymouth, though it does not appear to have been distinguished there from *P. anglorum,* until Dr. Moore published his Catalogue of the Birds of Devon. The latter is not a very common bird there, which may have been the cause of such a mistake."

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* Prodromus Isländ. Orn. p. 56 (1822). † Ornithologie, vi. p. 131 (1760).

"*P. major* is very well known to the Scillonians, by whom it is called *Hackbolt.* They inform me it is a constant visitant in the latter part of autumn, and represent its manners on the water as resembling those of *P. anglorum.* I recollect seeing four last year, through a telescope in Mount's Bay. It was late in the afternoon, the wind blowing hard from S.S.W., which accounted for their being so far inshore; they are generally deep-sea goers. They had exactly the flight of *P. anglorum,* and kept so close to the water as almost tô skim the tops of the waves. Mr. Clement Jackson told me last spring that they appear some autumns off Looe and Polperro in thousands."

Genuine examples of the Great Shearwater have been taken on the coasts of Devonshire and Dorset; but on our eastern shores there appear to be but few well-authenticated occurrences of this species. A bird shot on the 10th of January, 1874, near Flamborough, is in the collection of Mr. J. H. Gurney, jun.; and one captured near Spalding, in Lincolnshire, was forwarded alive to the Gardens of the Zoological Society of London (Zool. 1882, p. 464). Mr. Cordeaux informs the Editor that in September 1881, this species passed Flamborough in considerable numbers. Mr. R. Gray does not include the Great Shearwater in his 'Birds of the West of Scotland.'

In Ireland the Great Shearwater was obtained by Mr. R. Warren, near Downpatrick Head, on the 22nd August, 1859; and Mr. Robert Davis, jun., of Clonmel, sent the Author notice and a coloured drawing of two birds taken respectively in the autumns of 1838 and 1839. Mr. Davis says, "I kept the second specimen alive for about a week, but, not having a suitable place for that purpose, killed it and set it up. As well as I can recollect the former specimen, this resembled it in every respect. It was, however, more lively, and ran along very rapidly, with the breast about an inch and a half from the ground. Having, on one occasion, put it on a roof, it seemed to be more at ease on the inclined plane afforded by that situation, than on a flat surface; it mounted rapidly to the top, though when it came to the edge no attempt to fly was made, and it fell heavily to the ground. It rarely stirred at all during the day, but kept itself as much concealed as possible, and if it could not hide its body, would endeavour to conceal its head. The fishermen sometimes keep them for weeks about their houses, and in some instances they have become tame; they never attempt to fly. It does not appear that the Manks Shearwater is ever seen, nor could I ascertain that a Greater Shearwater was ever shot, but always taken with a hook. They are commonly known by the name of *Hagdowns.*" It is probable, from what is known of its geographical distribution, that it is of not unfrequent occurrence off the southern and western coasts. Examples obtained off the coast of Kerry are in the Museum of Science and Art, Dublin; and Major Feilden states that on the 19th of October, 1876, when returning from the Arctic Expedition in H.M.S. 'Alert,' in lat. 55° 44′ N., long. 35° 38′ W., a thousand miles from Cape Clear, he came upon birds of this species, which accompanied the ship across the Atlantic until within a few miles of the Skelligs and the coast of Kerry. Sir R. Payne-Gallwey thinks there is some chance that it may be found breeding on the outlying Blasquets, where, on the occasion of his visit in 1881, an old cliff-climber remarked, unprompted, that sometimes when searching for the Manx Shearwater, he had come upon a few birds of about double the size (Fowler in Ireland, p. 289).

In the Færoes and in Iceland the Great Shearwater is rare; but it is marked by Prof. Reinhardt as breeding in Greenland, where, according to Holböll, large numbers are found from the southern point of the country to 65° 30′ N. lat. It is abundant at times off Newfoundland. In the Azores it is replaced by *Puffinus kuhli,* a species which visits the western coasts of France and the Iberian Peninsula, and which is abundant in the Mediterranean. The range of the Great Shearwater in America extends as far south as Florida, and specimens referred to this species have been obtained at Tierra del Fuego, and also near the Cape of Good Hope.

Nothing definite is known respecting the nidification of the Great Shearwater, for the bird that breeds on the Desertas, near Madeira, and the egg of which was figured by Hewitson as belonging to *P. major*, is really *P. kuhli*. Nor have we many details respecting its habits. Its flight is described as very striking; with a single movement of the wings it alters its course, gliding down the valleys between the Atlantic rollers with a barely perceptible quiver, and without any apparent effort. As regards its food, Mr. Gurney states that the stomach of the bird shot near Flamborough contained the horny jaws of about half a dozen small cuttle-fish: the jaws varying from a sixteenth to a quarter of an inch in diameter; and similar remains have been found in the stomach of the Fulmar.

In the bird from which the lower figure in our woodcut was taken, the bill is dark purplish-brown, the hooked tip of the upper mandible bluish-grey; irides dark brown; head and occiput dark ash-grey; back of the neck almost white; back, wing-coverts, and tertials, ash-grey; all the margins greyish-white; primaries and tail-feathers blackish-brown; chin, sides, and front of neck, the breast, and sides of the body, white; lower belly, vent, and under tail-coverts dull white, slightly varied with ash-brown; legs, toes, and their membranes, flesh-coloured, drying to yellow. The whole length is eighteen inches; of the wing, from the bend, thirteen inches; whole length of the bill one inch and seven-eighths; of the tubular portion half an inch; of the tarsus two inches and one-eighth; of the middle toe and claw two inches and seven-eighths.

A specimen in the collection of Mr. E. Hargitt, taken at Fiskenasset, Greenland, on the 28th June, 1876, has the outer primaries in their sheaths and undeveloped.

PUFFINUS GRISEUS (Gmelin*).

THE SOOTY SHEARWATER.

THE SOOTY SHEARWATER represented by the upper figure in the woodcut at the head of the preceding species, is a more frequent visitor than has generally been supposed to the shores and the vicinity of the British Islands. As already stated, it was, until recently, considered to be the young of the Great Shearwater, and it is consequently impossible, in the absence of any description, to say to which of the two species many of the earlier records refer. Those which the Editor has been able to identify with the Sooty Shearwater are the following; but there are doubtless many more, for although not observed in such large flocks as the Great Shearwater has been in the south-west of England, the present species appears to be more generally distributed, especially along the eastern side.

The first example of which there is any record was exhibited at a meeting of the Zoological Society on the 12th of July, 1832, by Mr. Arthur Strickland, of Boynton, near Bridlington, in Yorkshire, who stated that it was shot by Mr. George Marwood, jun., of Busby, in the middle of August, 1828, on a very stormy day, at the mouth of the Tees; it was seen early in the morning, sitting on the water like a duck, and was shot as it was rising; its manner of flight was consequently not noticed. This specimen, which was then identified with *Puffinus fuliginosus*, Kuhl, was subsequently figured on the same plate with an example of the Great Shearwater (*P. major*), by Gould, in his 'Birds of Europe,' under the impression that they belonged to the same species. Another, obtained on the Northumberland coast, was described and figured by Selby (Ill. Brit. Orn. ii. p. 528, pl. 102*), under the name of *P. cinereus*, Stephens

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* *Procellaria grisea*, Gmelin, Syst. Nat. i. p. 564 (1788) ex Latham.

[nec Gmelin]. Next in date, as regards England, is the one obtained by the late D. W. Mitchell, in Mount's Bay, Cornwall, in the autumn of 1838, and figured in the woodcut with *P. major* in the present volume. Then comes a bird purchased alive by Mr. T. Southwell, on the 26th July, 1851, of a boy who caught it sleeping on the water at the mouth of the river Ouse, near Lynn, Norfolk, and which, after being kept for five days, was set up for the Museum of that town, where it still remains; but it was at the time recorded (Zool. pp. 3234, 3279) as *P. major*, an error only recently corrected (Tr. Norw. N. Soc. iii. p. 474). In the autumn of 1866 three Sooty Shearwaters were obtained, and several more were seen, as recorded by Mr. W. Boulton (Zool. 1867, p. 543), off Bridlington, but these again were supposed to be the young of *P. major*. At Whitby a specimen, now in the Museum of that town, was taken in September 1870 (Zool. 1884, p. 180); at Bridlington again, one presented to the Oxford Museum was obtained in 1872 (Zool. 1883, p. 121); one taken off Flamborough in 1881, is in the collection of Mr. J. Whitaker, of Rainworth Lodge, Mansfield; two identified by Mr. W. Eagle Clarke, were captured in the same locality in September 1883; and on the 17th of that month a specimen, which the Editor exhibited at a meeting of the Zoological Society, was shot by Mr. T. H. Nelson, off Redcar. On the Northumberland coast one was taken in August 1873, and is now in the collection of Mr. Raine, of Durham. According to Mr. Mansel-Pleydell, a Dorsetshire specimen is in the Frome Scientific Institute; and Mr. Gatcombe answers for two near Plymouth.

As regards Scotland, it would appear, from Saxby's 'Birds of Shetland' (p. 363), and Mr. R. Gray's 'Birds of the West of Scotland' (p. 505), that a Shearwater, which they call *Puffinus cinereus*, has been obtained in the Shetland Islands, and off Caithness; but no descriptions are given to lead to identification. Mr. J. J. Dalgleish has recently informed the Editor that a bird shot off North Berwick on the 27th August, 1878, and recorded (Pr. R. Phys. Soc.

Edinb. v. pp. 34, 376), under the names of *P. cinereus* and *P. major*, is really a Sooty Shearwater. As regards Ireland, Mr. R. Warren has now no doubt that the birds which he saw off Cork Harbour in August, 1849, and recorded by Thompson (B. Ireland, iii. p. 409) under the name of *P. major*, were really Sooty Shearwaters; Mr. A. G. More has identified one shot many years ago off the coast of Kerry (Zool. 1881, p. 334); and Mr. R. Lloyd Patterson has one, which was recorded, like so many others, as a Great Shearwater, shot in Belfast Lough on the 29th September, 1869.

The Sooty Shearwater visits the northern coasts of France, and the Editor has examined, in the collection of Dr. Marmottan, two examples taken off Crotoy, at the mouth of the Somme, on the 25th of September, 1872, and the 9th of June, 1875, respectively. It has occurred more than once in the Færoe Islands (Zool. 1878, p. 154), and it appears to be generally distributed over the Atlantic, being especially common off the Bay of Fundy—where it is known as the 'Black Hagdon'—Labrador, and Newfoundland, ranging for some distance up the coast of Greenland. These are, however, by no means the limits of its distribution, for Mr. Dresser states (B. of Europe, viii. p. 524) that Mr. Salvin and he are agreed as to the identity of examples from California, Chili, the Cape of Good Hope, Australia, and New Zealand. It is from the latter place that we derive our knowledge of its nidification, the species having been found by Mr. Travers to be common all round the coasts of the Chatham group (Tr. New Zeal. Inst. v. p. 220). He states that it burrows in peaty ground horizontally for three or four feet, and then turning slightly to the right or left, a rude nest of twigs and leaves being formed at the extremity of the hole. In this a single egg is laid, which Mr. Buller describes as white stained with reddish-brown, and measuring 3·25 by 2 in.* The male assists in the work of incubation, and the young birds, which are very fat, are esteemed a delicacy by the Maories, who hold them over their mouths in order to swallow the oily matter which is disgorged. The old birds roost on shore, and are very noisy during the night. The food of this species is probably of the same nature as that of its congeners.

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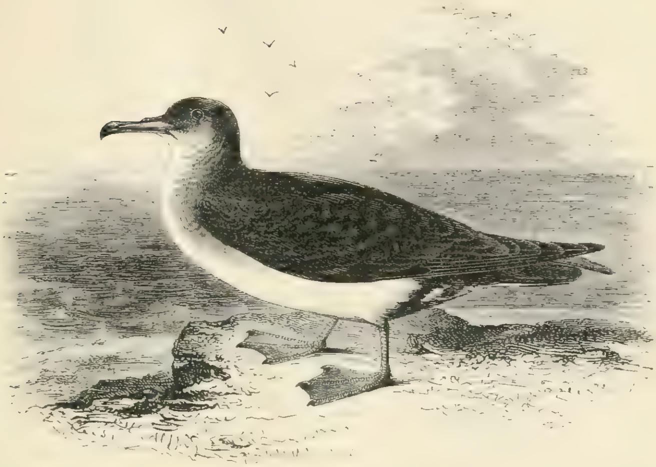
* The egg described by Mr. Buller is that of *P. tristris*, which is identified by Messrs. Salvin and Dresser with this species. It seems very large, considering that the bird is rather smaller than *P. kuhli*, whose egg averages 2·6 by 1·7.

In the bird from which the upper figure on p. 12 was taken, the bill is dark brown, the base of the under mandible lighter brown; irides dark brown; head and neck all round, and the back, dark clove-brown; scapulars and tertials the same, but with lighter-coloured margins; upper wing-coverts, primaries, and tail-feathers blackish-brown; under wing-coverts, breast and belly greyish hair-brown, each feather much darker in colour on the margin than over the centre; legs brown on the outer surface, but pale wood-brown on the inner; toes and their membranes yellowish-brown. The whole length of the bird is seventeen inches and one-quarter; wing, from the anterior bend, twelve inches and three-quarters; whole length of the bill one inch and three-quarters; of the tubular portion half an inch; of the tarsus two inches; of the middle toe, including the claw, two inches and five-eighths. Like other Petrels, this species exhibits considerable variation in size; in Mr. Nelson's bird the whole length is eighteen inches; the wing from the carpal joint thirteen and a quarter inches; bill two inches; tarsus two and a half inches.



PUFFINUS ANGLORUM (Temminck*).

THE MANX SHEARWATER.

Puffinus anglorum.

THE MANX SHEARWATER is the commonest species of the genus in the British seas, and as the period of incubation approaches it resorts to many portions of our coast, generally selecting small islands which are seldom made the residence of man. It owes its trivial name to Willughby, who speaks of it as the Puffin of the Isle of Man, where in his time, and until a comparatively recent date, it was abundant on the small island off the south-western extremity, known as the Calf of Man. In this locality it is believed by Mr. Crellin to have been extirpated by rats. Mr. T. Dix, writing in 1869, says that it breeds in numbers on Caldy Island, off Tenby, as well as on Skomer and Skokhum, two smaller islands to the northward (Zool. s.s. p. 1681); and a few may, perhaps, inhabit Lundy Island, in the Bristol Channel, where the bird is well known under the name of 'Cuckle.' On the Cornish coast, where, according to Couch, it is provincially called 'Skidden,' it is common, especially in autumn, and breeds on some of the Scilly Islands. Along the shores of the British Channel it is generally distributed, becoming rarer in the narrow eastern portion; but from the coast of Suffolk northwards it is observed in considerable numbers, particularly off Flamborough, although no breeding-station is known on the east side of England, or, indeed, of Scotland. On the western side, according to Mr. R. Gray, there are numerous breeding-haunts, especially within the circle of the Inner Hebrides; and to the westward, on St. Kilda, and on Pabbay, which is next to Mingalay, where the bird is known by the name of 'Scraib.' Capt. Elwes says (Ibis, 1869, p. 28) that this bird was formerly very common, and the young ones, which were called 'Fachach,' were so highly esteemed that a barrel of them formed part of the rent paid by each crofter in Mingalay to the Macneills of Barra. About a hundred years ago, however, the Puffins, which before were not numerous, began to increase very much, and drove the Shearwaters from the holes which they occupied in the cliffs; and now they have completely supplanted them, so that only a few pairs of Shearwaters are left in the island of Pabbay. At Bernera, on which a lighthouse has been built, none have nested since 1843. On the island of Rum there is a nursery of this species situated on the face of a hill among broken boulders about a mile from the sea; but in early times the breeding-place was on the coast, and the birds were then collected at the close of the season and salted for winter use. Several other haunts are enumerated by Mr. Gray, who adds that the Shearwaters make their appearance about the 10th of April, remaining until October. In the Orkneys and Shetlands, where the bird is known as the 'Lyrie,' information respecting the localities where it nests is only to be obtained with difficulty, owing to the estimation in which the young are held by the fishermen. The latter assert that the bird is never seen abroad in the daytime; but this, as

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* *Procellaria anglorum*, Temminck, Man. d'orn. ii. p. 806 (1820).

Saxby says, is quite incorrect, and the Editor remembers seeing large numbers one forenoon off Unst.

In Ireland there are in all probability a good many breeding-places among the little visited or scantily populated islands on the west coast. The Editor has taken its eggs on Rathlin Island, off the coast of Antrim, where, as in Donegal, the name 'Fachach' is used for the adults as well as the young; the Skelligs, off Kerry, is another spot; and there are also some stations in the St. George's Channel.

The Author was favoured by the late Mr. D. W. Mitchell with the following account of the habits of this species, as observed by himself off the coast of Cornwall :—

"To the westward of St. Agnes, in the Scilly group, lies a barren island called Annet. Its northern shore is abrupt and craggy, it gradually slopes towards the south, and narrows into a sort of peninsula, where the sandy soil is rich enough to produce a dense growth of short ferns. Here is the stronghold of the Shearwaters. Sit down on a rock which commands the little territory, and you will see nothing but the Terns, who have a station on the higher and central part of the island, and are making a flight of inquiry very much like the Black-headed Gulls in your vignette. Yes, you will see a hundred or two of Oyster-catchers, who do not like your landing so near their nests, and make short journeys hither and thither, whistling all the while like birds possessed. You will see two or three pairs of Turnstones, and a few Ring Dotterel; perhaps a Curlew. You may wait all a sunny day in June, but not a Shearwater will you see on land or water. There are plenty near you all the time, however, as you may ascertain by the odour which issues from the first burrow you look into among the ferns. As soon as the sun is down you will see a little party of five or six flitting silently across the sound, or steering out to sea. The latest fishers from the colony of Terns are coming home from the sandy shallows, five or six miles away, with their throats and beaks crammed with Lance-fish, when the Shearwaters begin to wake. You will not see them come out of their holes; you first catch sight of them skimming round the corner of a rock close to the water. Perhaps they will have a great gathering, such as I encountered one evening in 'Smith's Sound.' There was a congregation of at least three hundred, in the middle of the tide-way, washing, dipping, preening feathers, and stretching wings, evidently just awake, and making ready for the night's diversion. As I wanted a few specimens more than I had dug out of the burrows, I ran my boat well up to them, and when they rose got as many as I wished, besides a few unfortunate cripples who were only winged, and proved, by their agility in swimming and diving, a good deal too much for my boatmen. I think a good dog would have no chance with them. They allowed me to come quite close. They sit low in the water; they make no noise when disturbed, though in their holes they are eloquent enough, the Scillonian synonyms of *Crew* and *Cockathodon* being derived from the guttural melodies they pour forth as the spade approaches the end in which the egg is deposited. I once caught a pair in one burrow who were crooning a duet of this kind before we commenced operations. I presume they were in the honey-moon, as there was no egg. It is frequently deposited on the fine sandy soil without any preparation, though generally there is a slight accumulation of fern leaves and old stems. They produce but one egg, which, when fresh laid, is of the most dazzling whiteness, and of peculiarly beautiful texture; it measures two inches five lines in length, by one inch nine lines in breadth, and is very large for the size of the bird. When you kill a Shearwater by pressure, as I generally did for the sake of her skin, she vomits a most abominable oil, in which float so many particles of brilliant green that it appears of that colour, though the stain it leaves is yellow. The quantity got rid of in this way is sometimes enormous.

"When the young bird leaves the egg it is covered with greyish-black down, except a stripe along the centre of the breast and belly, which is white. I found a chick very lively in an egg which had been taken from the burrow two days previously to my examining it. My notice was attracted by hearing a little voice in the basket as I sat preparing a skin about midnight. I thought of Asmodeus in the bottle immediately."

The single white egg is deposited in a burrow or the crevice of a rock on a few blades of dried grass; it is smooth in texture, although without much gloss; there is comparatively little of the musky odour about it so obtrusive in the eggs of the Fulmar; and the yolk is a very pale yellow; average measurements 2·4 by 1·65 in. Incubation commences early in May, but, according to Saxby, if the first egg is taken the same bird will lay again some weeks later. The nestling remains in its home until long after it is fully fledged, and becomes enormously fat. The stomachs of the adults examined by Saxby contained the jaws of a small species of cuttle-fish, together with a small quantity of comminuted sea-weed, and some vegetable fibre. In the intervals of its rapid and somewhat angular flight this species has frequently been observed, contrary to a popular idea, to settle on the water, where, however, it seldom remains for long. In skimming the surface of the water it frequently ploughs it up with its breast. After severe weather, storm-driven individuals are not unfrequently picked up in our inland counties.

The Manx Shearwater breeds in considerable numbers in the Færoes; and is found on the coast of Norway and throughout the North Sea; it is believed to have some breeding-places on the islands off the coast of Brittany, and it undoubtedly nests about the Canaries, Madeira, the Desertas, and the Azores. It is stated by Reinhardt to have occurred in Greenland; and Mr. G. A. Boardman informed Mr. Dresser that it was common on the fishing-grounds off the Bay of Fundy. Capt. Savile G. Reid, R.E., states (Zool. 1877, p. 491) that there is a specimen in Mr. Bartram's collection at Bermuda which was captured whilst sitting on its solitary egg, some years ago. In the Mediterranean there occurs a resident form of doubtful specific distinctness, characterized, as a rule, by a larger amount of brown striations on the under tail-coverts. This is the

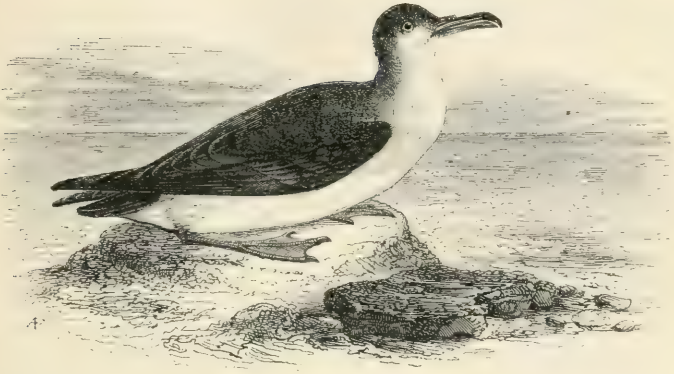
P. yelkouan of Acerbi, and the 'Ame damnée' of the Bosphorus, so often mentioned by travellers. Krüper and others have called it *P. obscurus*, thereby augmenting the confusion regarding the Shearwaters, but there is no evidence to show that the true Dusky Shearwater has ever occurred in the Mediterranean.

In the adult bird the bill is blackish-brown, but lighter brown at the base; irides hazel; head, back of the neck, back, wings, and tail uniform brownish-black; chin, and neck in front white; sides of the neck varied with dark grey and white in transverse bars; breast, belly, and under tail-coverts white; behind the thighs a patch of brownish-black; legs, toes, and their membranes yellowish flesh-colour.

The whole length of the bird is fourteen inches; from the anterior bend of the wing to the end of the longest quill-feather, nine inches and a half.

In the first plumage the upper parts are of a more sooty-brown than in the adult; the throat and breast are mottled with brownish-grey; flanks, abdomen and under tail-coverts brown; legs and feet brownish, membranes pale yellow. This description is taken from a male in the collection of the Editor, shot off Málaga on the 30th of January.

TUBINARES. *PROCELLARIIDÆ.*



PUFFINUS OBSCURUS (Gmelin[*]).

THE DUSKY SHEARWATER.

Puffinus obscurus.

THE interesting Shearwater figured above was brought to the Author by Mr. B. Blackburn, of Valentia Harbour, in the county of Kerry; who afterwards sent him the following note of its occurrence:—

"The Petrel which I left with you this morning flew on board a small sloop off the island of Valentia, on the south-west coast of Ireland, late in the evening of the 11th of May, 1853. Mrs. Blackburn had never observed it before on our coast, and we concluded it to be the *Puffinus obscurus* of Temminck and Gould. It made no attempt either to run or fly away, and suffered itself to be handled without exhibiting alarm; and though apparently strong and vigorous, manifested quite an oriental resignation to its fate." This specimen was exhibited at a meeting of the Linnean

[*] *Procellaria obscura*, Gmelin, Syst. Nat. i. p. 559 (1788).

Society on the 7th of June, 1853, as shown by the Minutes of that date.

In 'The Zoologist' for 1858 (p. 6096), Mr. Henry Stevenson recorded the appearance in Norfolk of a Shearwater which he believed at the time to be an example of this rare straggler to the shores of Great Britain, but the specimen was lost sight of, and has only recently been discovered. Mr. Stevenson's account has lately been published in the Transactions of the Norfolk and Norwich Naturalists' Society, iii. (pp. 467–475), and from it the following extracts are taken:—

"My original notes on this interesting bird may be thus summarized. About the 10th of April of the above year it was found dead by a gamekeeper on the Earsham Estate, situated close to the south-eastern boundary of Norfolk, and within a mile of the well-known town of Bungay in Suffolk.* Captain Meade, who at that time hired the Hall and the shooting, brought the bird, in the flesh, to the late Mr. John Sayer, birdstuffer, of St. Giles, Norwich, who at once observed its marked difference in size from any Manx Shearwaters he had ever seen. Being from home, myself, at the time, I did not examine the bird in a fresh state; but I saw it within a week of its being stuffed, and its resemblance to the figure of the Dusky Petrel in the third edition of Yarrell's 'British Birds,' and in the supplement to the second edition (1856), struck me forcibly at first sight; confirmed, to a great extent, by the comparison of its measurements (though a mounted specimen) with the description given of the species by that author.

"It proved, on dissection, to be a male in very poor condition, and probably had been driven so far inland by a gale, and met its death through coming in contact, at night, with a tree or some other object, having a wound on one side of the head as if from a violent blow. It showed no appearance of having been shot at; and the feathers, except on the spot mentioned, were clean and unruffled; but the inner web of one foot was partially nibbled away, as though a mouse or some other vermin had been at it.* Fortunately I noted these injuries at the time, which have enabled me to identify the specimen again, beyond any doubt, though lost sight of for the last thirteen years. Having been brought to the birdstuffer by Captain Meade, and returned to him when mounted and cased, I naturally inferred that the Petrel belonged to him; and hearing some time after that he had left England, and all his effects at Earsham had been sold off, I presumed that this rarity was lost to us altogether. In the absence of the bird itself, I was unable to support my previous conviction as to the species; whilst subsequent accounts of extremely small Manx Shearwaters being occasionally met with, made me question my own judgment in the first instance, more especially as my acquaintance with that class of marine birds was somewhat limited at that time. I specially mention this, because it will explain why I did not bring the fact of the Dusky Petrel having occurred in Norfolk under the notice of either the late Mr. Gould, when publishing his 'Birds of Great Britain,' or of Mr. Dresser for his 'Birds of Europe,' neither of which authors have included this species in the above-named publications. The re-discovery of the Norfolk specimen was quite accidental. Early in the present year, Mr. J. H. Gurney, jun., and myself, being separately engaged in working out a complete list of the 'Birds of Norfolk,' and comparing notes on the subject, the rights of this species to rank with other local rarities was questioned, and, 'drawing a bow at a venture,' Mr. Gurney put himself in communication with Mr. Hartcup of Bungay, who proved to be a trustee for the family of the late Sir W. W. Dalling, Bart., and the Earsham Estate. From him it was soon elicited that a good many birds killed on the estate were preserved at the Hall, and amongst these, most fortunately, was found the Dusky

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* Its flight inland, therefore, from the coast would probably have been between Lowestoft and Southwold.

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* "This was my impression at the time; but the examination of a large number of Pomatorhine and other Skuas, killed on our coast in 1877, showed that the webs of the feet, in this class of birds, are frequently mutilated."

Petrel of 1858. The thanks of this Society, and of naturalists generally, are due to Mr. Hartcup for the opportunities he has afforded for a thorough inspection (with permission to photograph it) of this unique specimen; and having, myself, first obtained the confirmatory opinions of Professor Newton and Mr. Osbert Salvin, it was exhibited by the latter at a meeting of the Zoological Society on the 16th of May, 1882."*

There appears to be no well-authenticated instance of the occurrence of the Dusky Shearwater on the Continent of Europe, nor in the Mediterranean, for Prof. H. H. Giglioli does not include it in the list of his rare birds obtained in Italy, and, as already mentioned, the bird to which the name of *P. obscurus* has frequently been applied is merely a form of the Manx Shearwater. The nearest haunts of the Dusky Petrel appear to be in the vicinity of the Canaries, Madeira, and perhaps the Azores. Mr. Edward Vernon Harcourt, to whom the Author was indebted for a specimen of the bird and its egg, has particularly referred to this species in his published Sketch of Madeira (pp. 122 and 165). Eight or nine species of the birds of this family breed on, or frequent, the Desertas, a group of small islands about eighteen miles east from Madeira. "The Dusky Petrel is a very tame bird, and will live upon almost anything; my bird would climb up my trowsers by its beak and claws to obtain small portions of food; it runs along the ground on its belly, and uses its curious-shaped bill in climbing up the rocks. Those I had in my possession alive, were some of them caught with fish-hooks baited with meat, by the Portuguese, and some taken by the hand in the day-time from underneath stones, where they hide from the light. The egg, and they lay but one, measures one inch and seven-eighths in length, by one inch and three-eighths in breadth, rather smaller at one end than at the other, and pure white."† The dimensions of an egg taken by Mr. Hurrell on the

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* See Proc. Zool. Soc. 1882, p. 421.

† The passage within quotation-marks does not appear to be in the above work, and was probably communicated to the Author by letter.—[ED.]

Desertas with the birds, and now in the Salmon collection of eggs at the Linnean Society, are 1·9 by 1·4 in.

The following account of the Dusky Shearwater as observed at the Bahamas is given by Dr. Henry Bryant in the Proceedings of the Boston Society of Natural History, vii. p. 132 :—

"On making inquiries as to what sea-birds breed on the kays, I was constantly told of a singular bird with a hooked bill that only flew during the night, and was known by the name of Pimlico; it proved to be the present species. It is very abundant, being found on all the uninhabited kays, near the channel, which are not too frequently visited by wreckers or fishermen. They breed in holes in the rock, as described in the 'Naturalist in Bermuda.' Near Nassau, at the Ship Channel kays, where I first met with them, incubation had already commenced by the 24th of March; the nest, consisting of a few dry twigs, is always placed in a hole or under a projecting portion of the rock, seldom more than a foot from the surface, and never, as far as my experience goes, out of reach of the hand; on being caught they make no noise and do not resist at all, unlike the tropic-bird, which fights manfully, biting and screaming with all its might. The egg does not seem to me to resemble an ordinary hen's egg; the shell is much more fragile and more highly polished. I broke a number of them in endeavouring to remove the bird from the nest. They vary a good deal in size and form, some of them being quite rounded and others elongated; three of them measured as follows: one ·059 by ·036, another ·052 by ·033, and the third ·051 by ·037: both sexes incubate. Why these birds and the Stormy Petrels never enter or leave their holes in the day-time, is one of the mysteries of nature; both of them feeding or flying all day, are yet never seen in the vicinity of their breeding-places before dark. When anchored in the night-time near one of the kays on which they breed, their mournful note can be heard at all hours of the night; during the day they may be seen feeding in large flocks, generally out of sight of land. They do not fly round much, but remain most of the time quiet upon the surface of the water. I did not see one on the banks, and never saw them dive or apparently catching any fish, though they are often in company with Boobies and different species of Terns, all of which are actively employed in fishing. About half-way from Andros to the Bank I saw, on the 26th April, a flock of Boobies, Sooty Terns, Noddies, Cabot's Tern, and the Dusky Petrel, that covered the surface of the water or hovered over it for an extent of at least a square mile. Their number must have been enormous."

At the Bermudas, where the Dusky Shearwater was formerly plentiful, and was known by the name of 'Cahow' as well as 'Pimlico,' it has, according to Capt. S. G. Reid (Zool. 1877, p. 491), almost ceased to breed. Capt. Reid found two nests in 1874, each containing a single young bird, which he describes as nearly ready to fly, but still retaining the long nestling-down, slate-coloured on the head and shoulders, light brown on the underparts; the former soon rubbed off, but the latter was more permanent, and was not got rid of for some days. One of these birds, which he kept alive for about six weeks, was remarkably tame, waddling awkwardly after his owner about the house and garden, feeding on fish and sleeping throughout the day in the darkest place it could find. So thoroughly nocturnal is this species that Capt. Reid is aware of only one instance of its being seen on the wing in Bermudian waters. Mr. Bartram told him that the statement made by the old historians of Bermuda as to the capture of the 'Cahow' at night is no exaggeration; for, on visiting an island one night where there were several pairs breeding, he quickly caught half a dozen of them, the stupid things settling on his body as he lay on the ground, and allowing themselves to be taken in his hand.

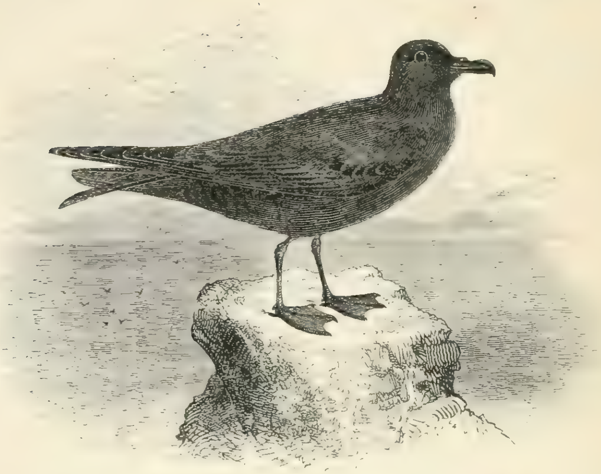
The Dusky Shearwater appears to have a wide oceanic range, both in the Atlantic and the Pacific. Mr. Osbert Salvin has specimens from Montserrat in the West Indies, New Zealand, and the Galapagos Islands on the west coast of South America; examples from Australia are in the British

Museum; and Capt. Cook is said to have met with it on Christmas Island in lat. 2° N., long. 158° W. In general appearance it is similar to the Manx Shearwater, but it is considerably smaller, the bill is much more slender, and the tint of the upper parts more distinctly black.

The whole length of the bird, as previously mentioned, is eleven inches; bill to the feathers on the forehead one inch; the nail curved and shining black, the other parts bluish-black; the top and sides of the head, including the eyes, the neck above, the back, upper tail-coverts, upper surface of the tail-feathers, and the same parts of all the wing-feathers ink black; chin, sides of the head below the eyes, throat, neck, breast, belly, under wing and tail-coverts white; on the sides of the neck, at the junction of the dark and light colour, the feathers are barred slightly; axillary plumes white; under surfaces of the primaries blackish-grey; darkest near the shaft of each feather, becoming lighter in colour over the outer part of each broad inner web; under surface of tail-feathers uniform lead-grey; legs, with the tarsal bones very much compressed, bluish ash-colour, toes the same, the interdigital membranes pale yellow when dried; irides brown.

Mr. Harcourt remarks that in the Dusky Shearwater all the secretions are green, whereas they are yellow in the Manx Shearwater.

TUBINARES. *PROCELLARIIDÆ.*



Bulweria colombina (Moquin-Tandon*).

BULWER'S PETREL.

Thalassidroma Bulwerii.

Bulweria, *Bonaparte*†.—Bill about as long as the head, stout at the base, compressed, rising at the unguis, which is large ; nostrils tubular, dorsal, rather short. Wings long, pointed, the first quill slightly the longest. Tail long and cuneate. Legs slender, the tibia bare for a short distance above the joint ; tarsi reticulated ; hind toe minute, elevated ; feet fully webbed, the inner toe shorter than the middle and outer ones, which are about equal ; claws curved.

The occurrence of Bulwer's Petrel in England was made known by the late Mr. Gould, who, in Pt. xxii. of his 'Birds of Europe' (1837), figured a specimen obtained in this country, with the following observations :—

"On the authority of Colonel Dalton, of Slenningford, near Ripon, we are enabled to add this rare species to the Fauna of Britain, from a fine specimen which was found on the banks of the Ure, near Tanfield, in Yorkshire, on

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[*] *Puffinus columbinus*, A. Moquin-Tandon, Orn. Canar. p. 44 (1841).

[†] Cat. metod. Ucc. Eur. p. 81 (1842). The affinities of the genus *Bulweria* are with *Æstrelata*, but the Editor has followed the order of sequence in former Editions.

the 8th of May, 1837; and which could not have been long dead, as it admitted of being mounted as a good cabinet specimen. It is now in the possession of Colonel Dalton, who doubtless regards it as one of the greatest treasures in British Ornithology." In the 'Birds of Great Britain,' however, Mr. Gould does not figure it, and in the Introduction he merely says, "This bird, which inhabits Madeira, sometimes visits our seas, and by Yarrell and others has been included in our avifauna." The figure of the bird here given is taken from Mr. Gould's plate, and represents, therefore, the only authenticated British example of this species at present known.*

The home of Bulwer's Petrel appears to be the Atlantic Ocean, especially the vicinity of the Canaries and Madeira. The first published account of it is given by Jardine and Selby (Ill. Orn. ii. pl. 65), who conferred on it the name of *Procellaria bulweri*, after Mr. Bulwer, for some time a resident in Madeira, to whom they were indebted for the specimen they described and figured. In 1841, we find it stated by Webb, Berthelot, and Moquin-Tandon, in the 'Ornithologie Canarienne,' that this species is very common on the small island of Alegranza, where it breeds in holes in the rocks, and is known by the name of 'perrito,' or 'little dog,' from its cry. About the year 1850 Dr. Frere obtained a considerable number of birds and eggs from the Desertas, near Madeira; Mr. Hurrell, in 1851, also took a good many there; and Mr. F. D. Godman gives (Ibis, 1872, p. 162) the following account of his later visit to those rocky uninhabited islands in 1871:—

"We found plenty of Bulwer's Petrels sitting on their eggs, which were in holes or under rocks, and usually about as far in as one could reach with one's arm. They build no nest, but lay their eggs on the bare rock. I did not find more than one egg in each nest. I secured several birds and eggs, and kept some of the former alive. It is curious to watch them crawling along the ground; for they cannot fly unless they get to the edge of a rock; they waddle along on their feet, and, when they come to a steep place, use the sharp-pointed hook of their beaks to draw themselves up with. They seem to dislike the light, and hide themselves under a rock or crawl into a hole as soon as possible; I never saw one of this species flying about in the daytime, though some of the smaller ones are common enough."

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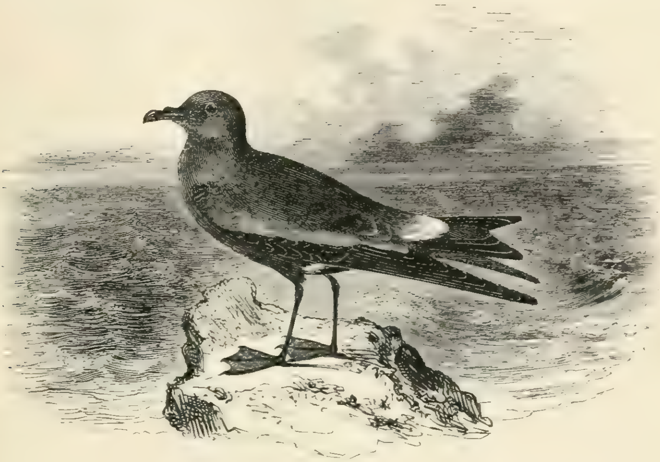
* There is a report of a second occurrence which can hardly be considered satisfactory. Mr. E. T. Higgins, writing from Penrith on the 29th of July, 1849, says, "By a letter received from Mr. Graham, the talented bird-stuffer of York, I hear that a specimen of that exceedingly rare bird, Bulwer's Petrel (*Thalassidroma Bulwerii*), was obtained at Scarborough during the spring" Zool. p. 2569).

The egg is pure white, the average measurements being 1·75 by 1·25 in.

In the Leiden Museum there is a specimen of this Petrel received from the Moravian missionaries, and said to come from Greenland, but the late Prof. Reinhardt informed Mr. Freke (Zool. 1881, p. 378) that he thinks it may have come from Labrador. With this exception, its range seems to be very limited; there is, however, a closely-allied species, *B. macgillivrayi*, found in the vicinity of the Fiji Islands.

In the adult bird the bill is black; the irides deep brown; the whole of the plumage almost uniform brownish-black, rather paler on the edges of the great wing-coverts; tail much graduated and cuneate; legs and toes dark reddish-brown, the interdigital membranes dark brown. The whole length, from the point of the beak to the end of the tail, ten inches and a half; wing, from the anterior bend to the end of the longest quill-feather, eight inches; bill three-quarters of an inch in length from the base; tarsus and middle toe, including the claw, one inch and one-sixteenth.

The nestling is said to be covered with a sooty-brown down.



CYMOCHOREA LEUCORRHOA (Vieillot.)*

THE FORKED-TAILED PETREL.

Thalassidroma Leachii.

CYMOCHOREA, *Coues*†.—Bill shorter than the head, moderately stout, compressed, rising slightly at the unguis, then decurved; nostrils tubular, dorsal. Wings long and narrow; the first quill-feather shorter than the second, which is the longest, and also than the third, and about equal to the fourth. Tail long and deeply forked. Legs short, slender; tarsi anteriorly reticulate; hind toe minute, front toes long and slender; webs slightly emarginate.

THE first British specimen of this Petrel was obtained at St. Kilda in the summer of 1818, by Mr. Bullock, during a tour round the coast of Scotland, principally undertaken with a view to investigate its ornithology. At the sale of Mr. Bullock's collection in the spring of 1819, this specimen was bought by Dr. Leach, and transferred to the national collection in the British Museum. At that time only three other examples of this species were known; one in the Museum at Paris, a second in the possession of Baron Laugier at Paris, and a third in the collection of M. Baillon, of Abbeville, which had been taken in Picardy.

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* *Procellaria leucorhoa*, Vieillot, Nouv. Dict. xxv. p. 422 (1817).

† Pr. Ac. N. Sc. Philad. 1864, p. 76. The present species is the type of this well-marked genus, two other members of which are found in the North Pacific.

This species, and the Storm Petrel next to be described, are mostly obtained in this country during the violent gales of wind which sometimes occur about the vernal or autumnal equinox, but particularly the latter. Several were procured during the stormy weather of the autumns of 1823, 1825, and 1831. So many examples have now been obtained, that it would be useless to enumerate the localities known. It may be sufficient to notice that it has occurred on various occasions in all quarters of Ireland, and in almost every maritime county of England; sometimes under peculiar circumstances. Mr. T. C. Heysham, of Carlisle, sent notice in November, 1841, of a Forked-tailed Petrel that was caught in a poke-net set for fish in the Solway Frith; and the Author obtained a bird that was sent alive to Leadenhall Market, but it was exhausted from want of food when brought to him, and died the same evening. Some are occasionally found in inland counties, at considerable distances from the sea, generally picked up dead or dying from starvation, having been driven far away from their usual sources of food. Mr. T. C. Eyton has recorded one taken near Shrewsbury; another was taken in Herefordshire; several near London; one near Saffron Walden; one at Bassingbourne, in Cambridgeshire; one in Derbyshire; one in the streets of Birmingham; and similar instances might be multiplied. On the east coast of England this species is of almost annual occurrence, especially, as Mr. Cordeaux informs the Editor, after gales from the west and north-west, from which he infers that the birds are driven right across the country. The stormy autumn of 1881 was unusually fatal to these ocean wanderers. Off Cornwall they are sometimes quite as numerous in winter as the Storm Petrel.

Along the shores of Ireland the occurrences of the Forked-tailed Petrel have been so general as to render special enumeration unnecessary; but as yet it has not been found breeding there. In Scotland the late Sir W. E. Milner found it breeding, in 1847, on the Stack of Dun, at St. Kilda (Zool. p. 2059); and in June, 1883, Mr. John Swinburne found it abundant on the island of North Rona. On the latter the principal colony visited was among some old ruins, where the birds seemed to nest in small companies, one large main burrow in the walls of the ruins serving for several pairs of birds, which made smaller burrows branching off at right angles to the main one (Pr. R. Phys. Soc. Edinb. viii. p. 64). Capt. H. J. Elwes says (Ibis, 1865, p. 28) that he has no doubt that it breeds on Mingalay, where the natives distinguish it by the name of 'Gobhlan-goidhe,' or forked-tail. Mr. R. Gray says that there is a more extensive colony in the island of Rum; but Mr. Swinburne states that he and other ornithologists have searched that island unsuccessfully for it. In winter it is frequently met with along the west coast and islands, but on the eastern side it is of rare occurrence.

The Forked-tailed Petrel has occurred on the coast of Norway; but, strange to say, it has only twice been obtained on Heligoland, although storm-driven individuals have been taken on the coasts of the German Ocean, Holland, Belgium, France, Portugal, and even in the Mediterranean. Mr. Vernon Harcourt states that it straggles to Madeira. On the American side of the Atlantic, it has been known to visit Greenland, and it is well known from Labrador to the Bay of Fundy, straggling as far south as Washington. Audubon, who enjoyed many opportunities of observing these Petrels during his ornithological researches in various parts of North America, as well as on his various voyages across the Atlantic, says, "The species of this genus with which I am acquainted, all ramble over the seas, both by night and by day, until the breeding-season commences; then they remain in their burrows, under rocks, or in their fissures, until towards sunset, when they start off in search of food, returning to their mates, or young, in the morning, and feeding them then. When you pass close to the rocks in which they are, you easily hear their shrill, querulous notes; but the report of a gun silences them at once, and induces those on the ledges to betake themselves to their holes. The Forked-tailed Petrel emits its notes night and day, and at not very long intervals, although it is less noisy than Wilson's Petrel. They resemble the syllables *pewr-wit, pewr-wit*. Its flight differs from that of the other two species, it being performed in broader wheelings, and with firmer flappings. It is more shy than the other species, and when it wheels off after having approached the stern of a ship, its wanderings are much more extended before it returns. I have never seen it fly close around a vessel, as the others are in the habit of doing, especially at the approach of night; nor do I think that it ever alights on the rigging of ships, but spends the hours of darkness either on the water, or on low rocks, or islands. It also less frequently alights on the water, or pats it with its feet, probably on account of the shortness of its legs, although it frequently allows them to hang down. In this it resembles the Storm Petrel, and Wilson's Petrel has a similar habit during calm weather. I have seen all the three species immerse their head into the water to seize their food, and sometimes keep it longer under than I had expected. The Forked-tailed Petrel, like the other species, feeds chiefly on floating mollusca, small fishes, crustacea, which they pick up among the floating sea-weeds, and greasy substances which they occasionally find around fishing-boats, or ships out at sea. When seized in the hand, it ejects an oily fluid through the tubular nostrils, and sometimes disgorges a quantity of food. I could not prevail on any of those which I had caught to take food." In the Pacific, the Forked-tailed Petrel ranges from San Francisco to the Aleutian chain, and thence to the Kuril Islands, and to Yezo, Japan.

The egg is white, freckled and zoned with rust-coloured spots, and measures about 1·3 by ·95 in. Incubation commences about three weeks earlier than is usual with the Storm Petrel. From the observations of Mr. Harry Merrill

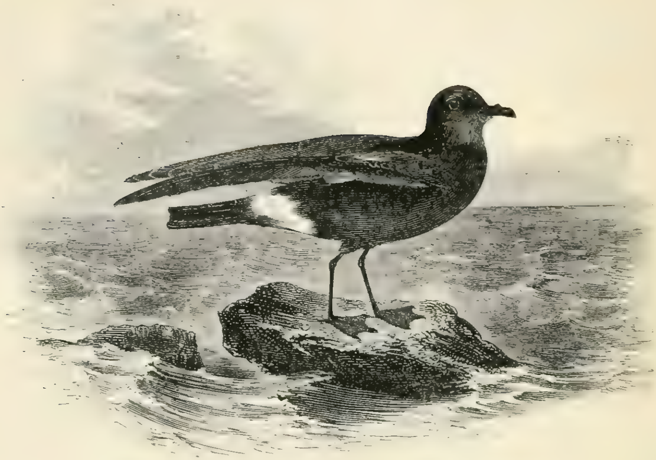
(Bull. Nutt. Orn. Soc. 1881, p. 249), it appears that males and females participate in the duties of incubation, contrary to the assertion of Mr. M. Hardy (*tom. cit.* p. 125), that the males alone do so, or at least take the larger share. When taken from the holes, the birds showed no disposition to fly, but on being released, would scuttle back into their burrows, or under some logs. They appeared to be completely dazed with the light, and if thrown into the air, would fly in an aimless and dazed way for a few moments.

The bill is black; the irides dark brown; the head, neck, and back, sooty-black; the forehead and throat rather paler, and a greyish tinge about the head and neck, the back rather the darkest in colour; wing-coverts brown, turning greyish on the edges; upper tail-coverts white; primaries and tail-feathers black; the tail forked, the outer feathers being half an inch longer than those in the middle; breast and belly sooty-black; behind each thigh, and extending over the sides of the vent and lateral under tail-coverts, an elongated patch of white; the vent and middle under tail-coverts sooty-black.

The whole length is seven inches and a quarter; from the anterior bend of the wing to the end, six inches; the length of the leg one inch. The sexes in plumage are alike.

The nestling is covered with long sooty down, giving it, as Mr. G. A. Boardman remarks, the appearance of a little long-haired mouse rather than of a bird, as neither wing nor bill are visible.

TUBINARES. *PROCELLARIIDÆ.*



PROCELLARIA PELAGICA, Linnæus.*

THE STORM PETREL.

Thalassidroma pelagica.

PROCELLARIA, *Linnæus*†.—Bill small, robust, much shorter than the head, straight to the unguis, which is decurved ; nostrils dorsal. Wings long, narrow ; the second quill-feather the longest, slightly exceeding the third ; the first quill shorter than the fourth. Tail of moderate length, slightly rounded. Legs moderate, the tarsi anteriorly reticulate, and a little longer than the feet ; inter-digital membranes emarginate ; claws rather short.

THE STORM PETREL, the smallest web-footed British bird known, has so often been the subject of notice by naturalists and writers generally, and even by poets, that little of novelty, consistent with truth, remains to be told. A year seldom passes without some of these birds being obtained on our shores, and it has happened occasionally that they appear in large flocks. Thus Messrs. C. and J. Paget, in their 'Sketch of the Natural History of Yarmouth and its Neighbourhood,' mention, that in November, 1824, between

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[*] Syst. Nat. Ed. 12, i. p. 212 (1766).

[†] *loc. cit.*

two and three hundred were shot after severe gales. Some years since, Mr. Gould exhibited twenty-four, in a large dish, at one of the evening meetings of the Zoological Society. In March, 1825, one bird of this species, while flying about over the Thames between the bridges of Blackfriars and Westminster, was shot from a coal-barge. These small birds are frequently driven by strong winds to great distances inland. Mr. Bicheno has recorded one taken near Newbury, in Berkshire; others have been taken in Oxfordshire; three or four are noticed as having been caught in the streets of the town of Coventry; and three within a few miles of Birmingham. This species appears to breed freely at many different places around us, generally on small islands; but is never observed to frequent land except during the breeding-season. Among some other notes recently referred to, Mr. D. W. Mitchell says, "The Stormy Petrel also breeds at Scilly, and is, as far as I know, confined to one locality, on the islet where the 'Thames' steamer ran ashore, in the extreme S.W. of the group. It is the latest layer among the sea-fowl; the first egg I took was newly dropped in the second week of June." Mr. Rodd says that, on fine summer evenings, small flocks may be observed in Mount's Bay, flying and hawking about in pursuit of insects, after the manner of Swallows, sometimes dipping, but seldom alighting on the sea, skimming for a few seconds with open wings, and mounting again in the air, regardless of the presence of man. The Storm Petrel is believed to breed on Lundy Island; and it certainly does so on several of the Channel Islands; also on some of the islets off the coast of Wales; but on the east coast of England it is not known to have any breeding-haunts. On that side its appearances generally take place in the autumn migration, at which period, as Mr. Cordeaux informs the Editor, individuals are frequently taken fluttering against the lanterns of light-houses and light-ships, although they very seldom get killed by striking. Unusual numbers occurred between October 27th and November 4th, 1883.

Among the islands of the west of Scotland, the Storm

Petrel has numerous colonies, and there are several in the Orkneys and the Shetlands. Mr. John Macgillivray, who visited the Hebrides in July, 1840, says, "The Stormy Petrel is abundant in St. Kilda. The island of Soa is the principal breeding-place, where, as well as in several spots among the others of the group, it nestles among *débris*, and in crevices of the rocks. The bird sits very close upon the nest, from which it will allow itself to be taken by the hand, vomiting, on being handled, a quantity of pure oil, which is carefully preserved by the fowlers, and the bird allowed to escape. It is only at sunset and about daybreak that I have observed the Stormy Petrel at sea, except during gloomy weather, save once, while crossing the Minch, being then not far from one of their breeding-places, at Dunvegan Head, in the Isle of Skye."

Mr. Hewitson thus notices the habits of this species at Foula, Papa, and Oxna:—"On the 31st of May, these birds had not arrived on the breeding-ground, or, to use the phrase of the fishermen, had not yet come up from the sea. Some eggs were deposited as late as the 30th of June. Each female lays but one, which is oval and white, measuring one inch one line in length, by ten lines in breadth.* At Oxna, where they breed under the stones which form the beach, I could hear them very distinctly singing in a sort of warbling chatter, a good deal like swallows when fluttering above our chimney-tops, but somewhat harsher. The nests seemed to have been made with care, of small bits of stalks of plants and pieces of hard dry earth. During the day the old birds remain within their holes, and, when most other birds are gone to rest, issue forth in great numbers, spreading themselves far over the surface of the sea; the fishermen then meet with them very numerously, and, though they had not previously seen one, are sure to be surrounded by them upon throwing pieces of fish overboard.'' Mr. Dunn found these birds plentiful on the small islands near St. Margaret's Hope, in Orkney, and among the small islands lying off Scalloway, on the west side of the mainland in Shetland ; and observes that, though he had watched them for hours he had never seen one dive.

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* Average measurements 1 in. by ·9 in. There is sometimes a more or less defined zone of rust-coloured spots. Like the Forked-tailed Petrel, these birds frequently have one main burrow from which smaller apertures branch off; and they are sometimes found nesting in such close proximity as to give rise to the impression that more than one egg is laid by the same female. The young have been found in the nest so late as the 18th of October.

In Ireland a good many breeding-stations are known, although these are probably but a small portion of those which exist. One of the former is Rathlin Island, off Antrim ; another is Tory Island, off Donegal, where Mr. G. C. Hyndman informed Thompson that he obtained upwards of a score, and on a reward being offered to the natives for the Forked-tailed Petrel (*P. leucorrhoa*), one was soon produced, "made to order" on the instant, by the middle tail-feathers being extracted, and the outer one at each side left! Other colonies are on the islands of the coast of Mayo, Galway, and Kerry, amongst which may be named the Skelligs, and the Blasquets, where they are named by the islanders 'Gourder' or 'Gourdal.' In Smith's 'History of Kerry,' printed in 1756, it is stated that these birds "are almost one lump of fat ; when roasted, of a most delicious taste, and are reckoned to exceed an *ortolan*, for which reason the gentry hereabouts call them the Irish ortolan : these birds are worthy of being transmitted a great way to market, for ortolans, it is well known, are brought from France to supply the markets of London''! In autumn and winter this species occurs all round the coast, and after stormy weather it has frequently been picked up inland.

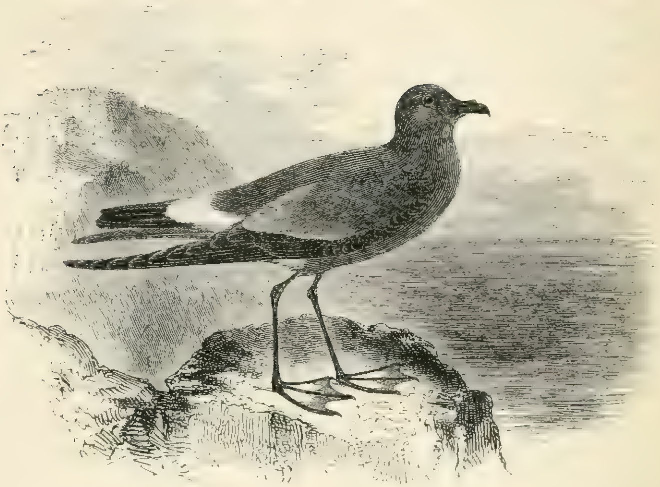
The Storm Petrel breeds abundantly in the Færoes, but is apparently an unfrequent visitor to Iceland, nor has its presence been authenticated on the coast of Norway beyond Lofoten, in 69° N. lat. Merely a straggler into the Baltic, it occurs throughout the North Sea and on the French side of the Channel, and it has several breeding-haunts off Brittany. Its range extends along the coasts of Spain and Portugal, and up the Mediterranean, where it breeds on many of the smaller islands, as far as the Ionian Sea ; storm-driven examples have also been obtained in many inland localities on the Continent. It visits Madeira, the Canaries, and the west coast of Africa down to Walvisch Bay; and the late Captain Sperling states that he met with it on the east side between the latitudes of Zambesi and Zanzibar. Crossing the Atlantic, we find that Mr. H. C. Hart, of H.M.S. 'Discovery,' observed two Storm Petrels off Godhaab, on the coast of Greenland, in 64° N. lat. (Zool. 1880, p. 210); and it is recorded from the banks of Newfoundland. Dr. Coppinger, of H.M.S. 'Alert,' states that twelve or fourteen Storm Petrels followed the ship, feeding greedily on offal, until the 5th of November, when in the neighbourhood of St. Paul's Rocks, near the equator. He noticed the neat and graceful way in which they planted their webbed feet on the water, and avoided wetting their tarsi, maintaining a stationary attitude with outstretched wings and legs straightened, while pecking at the object of their fancy. When performing a curve, they kicked the water with the outer foot. He frequently observed them floating on the surface with closed wings; in fact, they were only on the move when feeding; and, far from only following the ship in stormy weather, they were, in the tropics at least, more abundant during calms. They also followed the ship at night, which he found to be the best time for catching them, by means of sixty yards of light line armed with a small anchor-shaped piece of bottle-wire. The stomachs of those he examined contained a number of stony particles, bits of cinder, minute shells, and otolites of fish.

These birds rove over the greater part of the Atlantic and Mediterranean, feeding on the small fishes, crustacea, and mollusca to be found about the extensive masses of sea-weed which float upon the surface of the ocean. They are erroneously supposed to be seen only before stormy weather, and therefore are not welcome visitors to sailors, who call them the Devil's birds, witches, and Mother Carey's chickens —the last being alluded to by Captain Carteret in 'Hawksworth's Voyages,' i. p. 318 (1773), as a well-known sailor's name. Their habit of paddling along the surface is said by Buffon (Hist. nat. xxiv. p. 299), to have obtained for them from *English* sailors the name of Petrel, after the Apostle Peter, who attempted to walk on the water: the derivation being given as "pierre, pierrot, ou petit-pierre"!

Some interesting accounts of the habits of this species in captivity are to be found in 'The Naturalist,' iii. p. 214, and 'The Zoologist,' 1881, p. 489, from which it appears that the hooked bill and wings are freely used as means of progression. Mr. Scarth, when in Orkney, caught one on her nest in a small hole, and preserved her alive for three months in a cage, feeding her by smearing her breast with oil, which she sucked from the feathers, drawing each feather singly between her mandibles (Linn. Trans. xiii. p. 617).

The bill is black; the irides dark brown; head, neck, back, wings, and tail sooty-black; outer edges of wing-coverts greyish-white; upper tail-coverts white, tipped with black; chin, throat, breast, belly, vent, and under tail-coverts of a sooty-black, rather lighter than the upper parts; sides of the vent white; legs, toes, and membranes black. The whole length of the bird is not quite six inches; the wing, from the bend, four inches and five-eighths. The young bird, till twelve months old, is not quite so dark in colour; edges of wing-coverts rusty-brown; no white on the margins of the wing-coverts, and less white at each side of the vent. Mr. J. H. Gurney, jun., has an albino of this species.

The nestling is covered with a soft, wool-like, greyish-black down. The Rev. S. H. Saxby, who weighed five of these Petrels taken from their burrows, found that their average weight was nearly half an ounce.



Oceanites oceanica (Kuhl*).

WILSON'S PETREL.

Thalassidroma Wilsoni.

Oceanites, *Keyserling and Blasius*†.—Bill small and weak, the unguis gradually decurved; nasal tubes perfectly horizontal. Wings exceedingly long, the second quill-feather much the longest, the first quill being shorter than the fourth, and slightly exceeding the fifth. Tail almost square. Legs long and slender, bare for a considerable distance above the tarsal joint; feet nearly as long as the tarsi, membranes emarginate, hind toe absent.

This long-legged Petrel was noticed and figured as *Procellaria pelagica* by Wilson (Am. Orn. vii. p. 90, pl. lx. fig. 6), under the impression that it was identical with the Storm Petrel, but the earliest scientific description of it was given by Kuhl in 1820. In 1824 Bonaparte published a memoir on four species of Storm Petrels, with the distinctive characters, measurements, and figures of each, in the 'Journal of the Academy of Natural Sciences of Philadelphia,' vol. iii., and he there (p. 231), in ignorance of Kuhl's name, proposed to call this bird *Procellaria wilsoni*, in honour of the distinguished ornithologist, whose name can, however, only be handed down to posterity in the trivial appellation. In this memoir Bonaparte says, "I have never learnt that it has been seen on the coasts of Europe. I killed one, that had probably strayed, near the Azores"; and this appears to be the first printed notice of the occurrence of Wilson's Petrel on the European side of the Atlantic.

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* *Procellaria oceanica*, Kuhl, Beitr. Zool. p. 136, tab. x. fig. 1 (1820).

† Wirbelth. Eur. p. 238 (1840).

Some years ago the Author saw two skins of this species which had been taken by the captain of a ship, while sailing up the British Channel. The muscles about the wings of these specimens, when closely examined, proved to be still soft and moist, and he was told that these two birds had been caught by the captain himself, from the stern of the ship, with a baited hook at the end of a long slender line of thread. These are the specimens referred to by the Rev. L. Jenyns, in his British Vertebrata. Subsequently the late Mr. Gould stated (P. Z. S. 1839, p. 139), that on his voyage to Australia in May, 1838, he saw Wilson's Petrel in abundance immediately off the Land's End, and it continued to accompany the ship throughout the Bay of Biscay, the little Storm Petrel being also seen, but in far less numbers. In November of the same year, 1838, a specimen of Wilson's Petrel was found dead in a field near Polperro, in Cornwall, and a record of the occurrence was published in the second volume of the Annals of Natural History, by Mr. Couch, who very kindly sent the bird, when preserved, to the Author, that a drawing might be taken from it as a British specimen. In the spring of 1839, Mr. Charles Buxton, of Norfolk, sent notice of one said to have been obtained in that county, and Mr. J. H. Gurney has another, purchased some years ago; but Mr. J. H. Gurney, jun., writes that he is doubtful as to either of them being really British-killed. The Author was informed of the occurrence of another by the late Mr. T. C. Heysham, of Carlisle; and Mr. F. Bond records one killed in Sussex (Zool. 1843, p. 148). The

Rev. G. S. Marsh states (Zool. p. 6492) that one was picked up dead at Sutton Benger, near Chippenham, in Wiltshire, by a labourer who, being persuaded by his wife that it was merely a Swift, threw it down again, when another labourer, arguing that a Swift had not webbed feet, secured it, and brought it to the vicarage. Mr. C. Delmé Radcliffe, who was familiar with the species from having taken examples off the coast of South America, states that he picked up one in November, 1863, on the shore at Freshwater, in the Isle of Wight. Mr. N. F. Hele writes in his 'Notes about Aldeburgh' (p. 176), that "a single individual was obtained some years since in this neighbourhood, and is in the possession of Col. Thellusson." Mr. W. E. Clarke mentions (Hbk. Yorks. Vertebs. p. 85) that one shot near Halifax late in November, 1874, is in the collection of Mr. Christopher Ward, to whom it was brought in the flesh. Other examples have probably occurred, but have not, perhaps, been distinguished by those into whose hands they may have fallen. As yet there is no record of this species in Scotland; and as regards Ireland, all that can be said is, that a specimen was presented to Thompson in August, 1840, by Glennon of Dublin, who believed it to have been obtained in that country.

In France, according to Degland and Gerbe, M. Hardy received in the flesh, in December, 1854, two examples taken in the Gulf of Gascony; and one obtained at Guétary, near Biarritz, on the 3rd of December, 1872, is in the collection of Dr. Marmottan, at Paris. Stragglers are said to have been taken on the coast of Provence, and it certainly enters the Mediterranean, for the Editor possesses a female captured off Málaga on the 7th of August, 1873 (Bull. Soc. Zool. Fr. 1877, p. 205); and Dr. Salvadori has recorded an example in the University Museum of Cagliari, said to have been obtained off Sardinia. Mr. Godman found this species common in summer about the Azores, and it has been taken in many localities on the west coast of Africa down to the Cape of Good Hope. Four examples were obtained on the 'Challenger' expedition, off the Antarctic ice barrier on the 14th February, 1874; the Rev. A. E. Eaton, naturalist to the Transit-of-Venus Expedition, found it breeding on Kerguelen Island; and its range appears to extend over the South Atlantic to Australia and New Zealand, and across the South Pacific to Chili and Peru. In the North Atlantic it is common along the American coasts, visiting the West Indies and Mexico. It has been stated by Audubon that Wilson's Petrel bred on the Mud Islands off Nova Scotia, and former Editions of the present work contained a lengthy extract upon its nidification and habits; but the accuracy of his observations being unconfirmed and, in fact, denied, it has been considered expedient to substitute the following account of the breeding of this species on Kerguelen Island, as given by the Rev. A. E. Eaton (Phil. Trans. clxviii. p. 133) :—

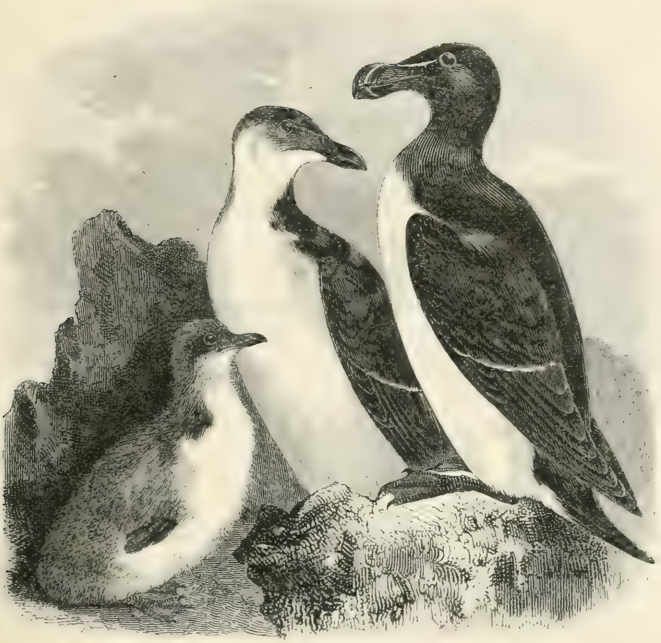
"From the 10th of October, when we passed Cape Sandwich, until the middle or third week of November, we completely lost sight of the Storm-Petrels. About the period last mentioned, however, they began to frequent Observatory Bay in large numbers. Their first appearance in it took place during a strong breeze which lasted several days. When this was succeeded by more moderate weather we saw little of them in the day-time; but towards evening they used to fly over the water like Swallows, and some of them might be observed flying near the ground far away into the country, following the course of the valleys or playing round the inland cliffs. We tracked them along the lower hillsides and the margins of lakes over rocks and bogs; but our efforts to learn what became of them were unattended with success. Probably at that time they were not preparing to breed, and the birds were merely going overland from the bay to other inlets of the sea. At length, when we went to Thumb Peak, their mode of nesting was discovered. Carefully watching, with Lieut. Goodridge, R.N., the birds flying to and fro about the rocks, we observed that they occasionally disappeared into crevices amongst piles of loose stones, and crept under loose masses of rock. Having meanwhile ascertained their call, we were able, by listening attentively, to detect the exact positions of several of these hidden birds. They were easily caught when the stones were rolled aside; but they were in couples, merely preparing for laying, and therefore we did not find any eggs. On our way back to Observatory Bay after the Transit, we called at the American Station, and were informed by Dr. Kidder that he had observed this Petrel on the shore near Molloy Point. The seashore in the neighbourhood of Observatory Bay is of a different character (for the most part) from that which is adjacent to the American Station, and, being less favourable than it, was seldom resorted to for nesting by the Petrels. But the country in general about our bay afforded them unlimited accommodation; for, provided that they can find a slope of shattered rocks with suitable chinks and crevices, or dry spaces under stones or large boulders sheltered from draughts, whether they be near the Sound or on the sides and summits of high hills, they readily appropriate them. The egg is laid upon the bare ground within the recess selected by the birds, either in a chance depression formed by contiguous stones or in a shallow circular hollow excavated in the earth by the parent. Having found numbers of their nesting-places, I will describe my method of searching for them. Whenever there was a calm night I used to walk with a darkened bull's-eye lantern towards some rocky hillside, such as the Petrels would be likely to frequent. It was best to shut off the light and keep it concealed, using it only in dangerous places where falls would be attended with injury and progress in the dark was hardly possible, lest the birds seeing it should be silenced. On arriving at the ground selected it was probable that Storm-Petrels would be heard in various directions, some on the wing, others on their nests, sounding their call at intervals of from two to five minutes. Those on the nest could be distinguished from others flying by their cries proceeding from fixed positions. Having settled which of the birds should be searched after, a cautious advance had to be made in her direction, two or three steps at a time, when she was in full cry. As soon as she ceased, an abrupt halt was imperative; and a pause of some minutes might ensue before she recommenced her cry and permitted another slight advance to be effected. In the course of this gradual approach the position of the bird might be ascertained approximately; but it had to be determined precisely; and to learn exactly where she was, she had to be stalked in the dark noiselessly. No gleam could be permitted to escape from the lantern. Loose stones and falls over rocks—to avoid them it was sometimes necessary to dispense with slippers, and feel one's way in stockings only; for should the Petrel be alarmed once with the noise or the light, she would probably remain silent a considerable time. Now and then it would happen that upon the boulder beneath which she was sitting being almost attained the bird would cease calling. When this occurred, and many minutes elapsed without her cry being resumed, it was advisable to make a détour and approach the rock from the opposite side, as her silence might be attributed to her seeing a person advancing towards her, and she would probably recommence her call so soon as he was out of sight. If she did not, a small pebble thrown amongst the rocks would usually elicit some sounds from her, as she would most likely conclude that the noise was being made by her mate returning to the nest. When the stone beneath which the bird was domiciled was gained at last, redoubled care had to be exercised. By stooping down and listening very attentively her position could be accurately ascertained. Then the lantern was suddenly turned upon her before she had time to creep out of sight, and her egg could be secured with the hand, or with a spoon tied on to a stick. Sometimes I worked without a lantern, and marked the positions of the nests with piles of stones, so that they might be revisited by day. Several eggs were obtained in February from nests which had been thus marked early in the previous month. The first egg taken by us was found by a retriever on the 22nd of January, on an island in Swain's Bay. Captain Fairfax sent me a nestling a day or two before we sailed for the Cape. Two of the eggs were laid in unusual situations: one of them was found by a man under a *Pringlea* plant;

but this may have been an egg of *Procellaria nereis*. The other was deposited just above the tide-mark, in a cavity of a rock rather open to the air and light. I had found the bird there one night, had taken her up in my hand, and had gently replaced her in the hollow, nearly a month before the egg was laid. The young bird in the egg has the tarso-metatarsal joint short. In the South-African Museum there is a specimen of *P. oceanica* from the S.E. coast of Africa, another from the S. coast of Africa, and two from Table Bay."

Nine eggs, brought from Kerguelen by Mr. Eaton, were described by the Editor (Phil. Trans. clxvii. p. 164) as averaging 1·3 by ·9 in., of a dull white colour, with minute purple-red spots, which generally form a zone, usually at the larger end.

The bill is black; the irides dark brown; the head, neck, back, wing-primaries, and the tail-feathers, dark brownish-black; greater wing-coverts and the secondaries dark rusty-brown, lighter in colour near the end, with the extreme edges and tips white; upper tail-coverts white; chin, throat, breast, and all the underparts sooty-black, except the feathers near the vent on each outside, which are white; some of the under tail-coverts are tipped with white, and the bases of the outer tail-feathers are white; legs long and slender; the toes black with an oblong yellow patch upon each web. Total length of specimen seven inches and a half; the wing, from the anterior bend to the end of the longest quill-feather, six inches and one-eighth; length of tarsus one inch three-eighths; middle toe and claw one inch and three-sixteenths.

The Editor's example from Málaga, obtained on the 7th August, is renewing its tail-feathers.



ALCA TORDA, Linnæus.*

THE RAZOR-BILL.

Alca torda.

ALCA, *Linnæus*†.—Bill straight, large, compressed, very much decurved towards the point, basal half of both mandibles covered with feathers, grooved towards the point, the superior mandible hooked, the under one forming with it a salient angle. Nostrils lateral, marginal, linear, near the middle of the beak, the aperture almost entirely closed by a membrane covered with feathers. Legs short, abdominal ; only three toes, all in front, entirely united by membrane ; claws but slightly curved. Wings short. Tail pointed.

THE members of the family of the Auks are oceanic birds that can swim and dive well, and in this way obtain small fishes of various sorts, or still smaller crustacea, as food.

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* *Alca Torda*, Linnæus, Syst. Nat. Ed. 12, i. p. 210 (1766). † *loc. cit.*

The Auks are confined to the higher or temperate regions of the Northern hemisphere, and structurally they show no close affinity with the *Spheniscidæ* or true Penguins of the Southern oceans, although frequently associated with them in popular ideas, owing to a confusion of trivial names, and a superficial resemblance.

The Razor-bill is one of our best known species, although inferior in numbers to the Common Guillemot and the Puffin. All three may be seen in the tide-way of the open sea around our coast at any season; but as their numbers are there dispersed over an extensive surface, these birds are best observed during the breeding-season, when they assemble by hundreds, or more frequently by thousands, on many of the most extensive and highest rocks and cliffs of our sea-girt islands.

About the middle or latter part of March in the south of England, and early in April in the northern portions of our islands, the Razor-bills, Guillemots, and Puffins converge to particular points, where, from the numbers that congregate, and the bustle apparent among them, confusion of interests and localities might be expected. It will, however, be found that, as a rule, the Guillemots occupy one station or line of ledges on the rock; the Razor-bills another; the Puffins a third; the Kittiwake Gulls a fourth; whilst the most inaccessible crags seem to be left for the use of the Herring Gulls. The Razor-bills generally select the higher and rougher ledges, and they are partial to crevices, their eggs being sometimes deposited so far in that it is no easy matter to get at them; at other times they lay their eggs on the broader shelves along with the Guillemots, but not so closely together. At the Farne Islands the Editor once saw a Razor-bill sitting on her egg in the old nest of a Cormorant. When incubating they lie on their eggs, the mate often standing by the side of the sitting bird. Sometimes the male brings food to the female, but both birds take their turn at incubation, one having been seen to fly to the sitting one and give it a gentle peck, when the latter immediately ceded its place. The egg of the Razor-bill differs in size, form, and colour from the lengthened pear-shaped egg of the Guillemot, and it seldom, if ever, shows even the faintest tinge of green; it measures on the average 2·8 by 1·9; the ground-colour is white, blotched and spotted with red-brown and blackish-brown, sometimes mottled all over with a rich coffee or chocolate colour. On shining the empty shell against the light, it will be observed that the inside lining-membrane shows *green* in the Razor-bill's egg, whereas in that of the Guillemot it shows *yellowish-white*, unless overpowered by the green of the outer shell. Certain western localities are famous for yielding a large proportion of handsome eggs of this species, as Flamborough is for its red-brown Guillemot's eggs. The first eggs are obtained about the middle of May.

Mr. Theodore Walker has given (Zool. 1871, p. 2427) the following account of this species as observed at Barra Head, in the Outer Hebrides :—

"The habits of the Razor-bill and Guillemot are very similar; they both take about three weeks and four days from the time they are hatched until they leave the islands. When once they are enticed down they do not return to the rocks; not being full-fledged they could not very well fly up. They generally fly down to the sea before sunrise: I have seen scores fly down to the sea on a fine morning. At the time they leave they are not full-fledged, only the wing and tail being feathered; the neck and line of the spine from the wing to the tail is still downy. I observed one Razor-bill enticing her young one to follow her down to the sea. I don't think it got any food that day, as it ran about from one bird to another, crying all day and all night: until nearly daylight it was still crying, but by the time I put out the light it was nowhere to be seen; doubtless the mother had returned about that time and enticed it off with food. Sometimes, when the young one is obstinate, the mother will take it by the back of the neck and fly down to the sea. It is great fun watching the old bird teaching the young one to dive: the mother takes it by the neck and dives with it; up comes the young one again, only to get another dose ; but the young bird cannot remain so long under water as the mother, and it often dodges her by diving for an instant. The young birds remain in the sea for one or two days, when they all prepare to leave, the old birds getting restless and taking short flights. One can generally tell the night before they leave, as they make such a noise : should the wind be favourable they take their departure before sunrise in small strings."

Of late years there has been a noticeable and unaccountable diminution in the number of Razor-bills on the British coasts. This may partly be owing to severe visitations of mortality which have from time to time affected many sea-birds, but especially the present species. Mr. R. Gray states that in 1859 thousands of dead birds, the Razor-bills being in the proportion of ten to one, were observed in the Irish Sea and on the west coasts of Scotland, and in that instance Mr. D. Robertson (Pr. N. H. Soc. Glasgow, i. p. 4) traced the reason with tolerable certainty to the sudden disappearance of the small herring fry and other fishes after heavy gales, leading to emaciation and starvation. Mr. Gatcombe's experience is similar. The Razor-bill is, however, nowhere so abundant as the Guillemot, although its general distribution is about the same in the British seas and along our coasts. After storms, individuals have occasionally been found in the most inland districts of our narrow islands.

The Razor-bill breeds in the Færoes, Iceland, Norway, Sweden, and some of the Baltic Islands ; but Mr. J. H. Gurney jun., informs the Editor that it no longer does so on Heligoland. There are stations on the French coast, both in the Channel and in Brittany, south of which it is not positively known to breed in Europe. On migration a few visit the Mediterranean Sea as far east as Malta ; but the majority keep well out in the Atlantic unless driven into the bays by stormy weather. It breeds on the west coast of Greenland, as far north at least as Arveprins Island (about 70° N. lat.), where Major Feilden observed that one, out of many which were shot, had its hatching-spot on the side under the wing, and not on the belly, as usual, showing that this bird must have lain on its side during incubation (Zool. 1878, p. 378). It is not, however, known to cross to the western side of Davis Strait and Baffin Sea, nor can its continuous range be traced to the North Pacific, where it is said to occur in Japanese waters, although confirmation of this is wanting. On the Atlantic side it breeds in abundance on the coasts of Labrador and Newfoundland, ranging southwards in winter to about 40° N. lat.

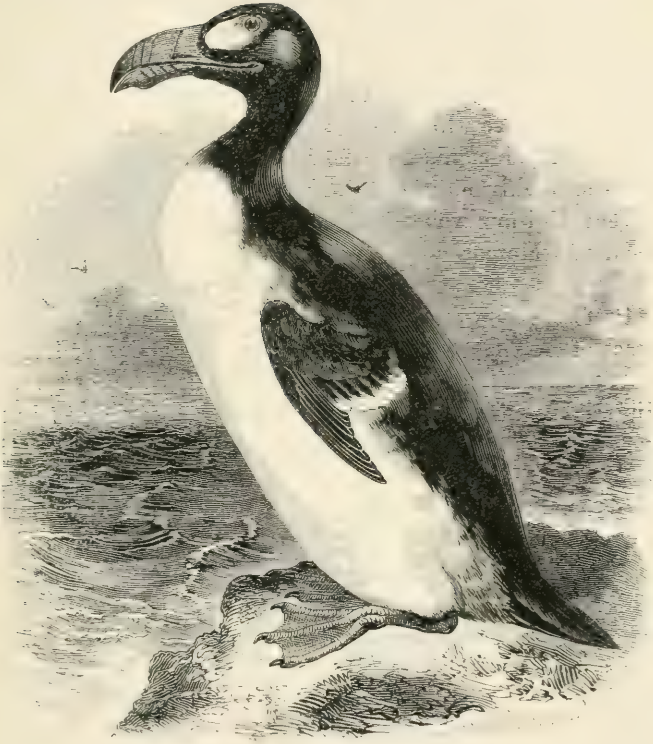
Both sexes are alike in plumage, and in summer the beak is black, with three transverse grooves and one white line on the upper mandible, two shallower transverse grooves and a white line on the lower mandible ; from the top of the beak to each eye there is a well-defined streak of pure white ; irides dark brown ; the upper part of the head, hind neck, back, wings, and tail black ; chin and throat dark brown ; the tips of the secondary quill-feathers, the breast, and all the under surface of the body pure white ; legs, toes, and their membranes brownish-black. In winter the colour of the upper parts is browner, and the throat, front neck, and sides of the head are white. The whole length about seventeen inches ; wing, from the wrist, seven inches and a half.

A young bird of the year, killed in December, represented by the central figure in the illustration, has the beak smooth and black, as yet without ridge, groove, or white line on either mandible ; the white line from the top of the beak to the eye observable, but not very pure in colour, being mixed with a little black ; chin, throat, neck in front, and on the side at the upper part, cheeks, and ear-coverts white. It only differs from the adult bird in winter in the character of the beak, which is smaller and has not then acquired the grooves or lines so conspicuous in the old bird. The young bird retains its white throat till the spring moult, when it assumes the black throat peculiar to the breeding-season ; by the middle of May the bill exhibits a whitish band, but the grooves are not well defined until the following year, when it breeds.

A young bird about a week old, obtained from the rocks at the Isle of Wight, has the beak smooth and black, no white line to the eye, but the chin and throat are white, with a few greyish-black hairs about the middle of the neck in front; the head and hind neck black, with a few white hairs; body above and the wings dull sooty-black.

Mr. Cordeaux informs the Editor that in a variety shot at Flamborough on the 30th January, 1875, now in the collection of Mr. J. H. Gurney, the bill, legs, and feet were bright yellow, the plumage being that of the ordinary winter dress, excepting that the dark portions of the head and neck were somewhat paler than in normal examples. In May, 1873, when off Rye in a yacht, he saw one of a pair which had the nape, neck, upper part of back, and wing-coverts of a very light brown, giving the bird a singularly piebald appearance. Mr. George Maclachlan, for some years lighthouse-keeper at Barra Head, and one of our most careful observers, states that he has seen a small proportion of Razor-bills and Guillemots with light-brown backs, and he is of opinion that this colour is hereditary (Pr. N. H. Soc. Glasgow, iv. p. 284.

Saxby records (B. of Shetland, p. 314) an adult female shot on the 17th December which had no white line between the base of the bill and the eye; and a similar example from Scotland is in the British Museum.



ALCA IMPENNIS, Linnæus.*

THE GREAT AUK,

OR GARE-FOWL.

Alca impennis.

THE GREAT AUK was described as a very rare British Bird when the 1st Edition of this work was published in 1843, but in all probability neither the Author nor the majority of the ornithologists of that generation suspected that the destruction of the last-known individuals of the species was even then on the point of accomplishment. Another forty years have elapsed since the latest authenticated examples were obtained on Eldey near Iceland, and there can now be little doubt that this species must be added to the number of those which have been exterminated by the agency of man; but inasmuch as the species, so long as it survived, was thoroughly entitled to a place in the British list, the present Edition would be incomplete without a notice of it, albeit 'In Memoriam.'

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* Syst. Nat. Ed. 12, i. p. 210 (1766).

Foremost among the British historians of the Great Auk is Professor Newton, whose contributions, entitled 'An Abstract of Mr. J. Wolley's Researches in Iceland concerning the Gare-fowl' (Ibis, 1861, p. 374); 'The Gare-fowl and its Historians' (Nat. Hist. Rev. v. p. 467); and articles in the 'Encyclopædia Britannica,' Ed. 9, under 'Birds' (Vol. III.), and under 'Gare-fowl' (Vol. X.); are alike remarkable for their condensed information and for their correction of errors. Valuable also are the notes 'On the Great Auk,' by Mr. J. H. Gurney, jun. (Zool. s.s. pp. 1442, 1639); Prof. John Milne's 'Relics of the Great Auk' (Field, 27th March, 3rd and 10th April, 1875), giving an account of the writer's visit to Funk Island, off Newfoundland, followed by an excellent sketch of the literature of the subject; and Dr. J. A. Smith's 'Notice of the Remains of the Great Auk in Caithness' (Pr. Soc. Antiq. Scot. xiii. pp. 76–105). To the above, especially, and to others too numerous for mention, the Editor has been much indebted in the compilation of the following, and necessarily brief notice. As regards the anatomy, Professor Owen's 'Description of the Skeleton of the Great Auk' (Tr. Zool. Soc. v. p. 317) is well known; and amongst foreign writers the names of Steenstrup, Preyer, V. Fatio, and Blasius stand conspicuous.

The earliest mention of the Great Auk, under the name of Gare-fowl, in the British Islands, occurs in the 'Account of Hirta [St. Kilda] and Rona, &c., by the Lord Register, Sir George McKenzie of Tarbat,' probably written a little before Sir R. Sibbald's brief allusion in his 'Scotia Illustrata,' printed in 1684. In June 1697, 'M. Martin, Gent' passed three weeks on St. Kilda, and to him we are indebted for an often-quoted description. In 1758, the Rev. Kenneth Macaulay states, on hearsay from the natives of St. Kilda, that "they do not receive annual visits from this strange bird as from all the rest in the list, and many more"; showing that it was even then becoming scarce. Low, who died in 1795, says in his posthumously-published 'Fauna Orcadensis' (p. 107), that he could not find that it was ever seen in the Orkneys; but Bullock, who visited that group in 1812, was more fortunate, as shown by the following extract from Montagu (Suppl. Orn. Dict. App. A):—"The natives in the Orknies informed Mr. Bullock on his tour through these islands several years ago, that only one male had made its appearance for a long time, which had regularly visited Papa Westra for several seasons. The female (which the natives call the Queen of the Auks), was killed just before Mr. Bullock's arrival. The King, or male, Mr. Bullock had the pleasure of chasing for several hours in a six-oared boat, but without being able to kill him, for though he frequently got near him, so expert was the bird in its natural element that it appeared impossible to shoot him. The rapidity with which he pursued his course under water was almost incredible." About a fortnight after Mr. Bullock had left Papa Westra, a bird, presumably the same, was obtained and sent to him, and at the sale of his collection was purchased for the British Museum, where it still is.

In 1821, or 1822, Dr. Fleming, who accompanied Mr. Robert Stevenson on his annual lighthouse inspection, wrote as follows:—"When on the eve of our departure [18th August] from this island [Glass, more commonly known as Scalpa], we got on board a live specimen of the Great Auk (*Alca impennis*), which Mr. Maclellan, the tacksman of Glass, had captured some time before off St. Kilda. It was emaciated, and had the appearance of being sickly; but, in the course of a few days, it became sprightly, having been plentifully supplied with fresh fish, and permitted occasionally to sport in the water, with a cord fastened to one of its legs, to prevent escape. Even in this state of restraint it performed the motions of diving and swimming under water, with a rapidity that set all pursuit from a boat at defiance. A few white feathers were at this time making their appearance on the sides of its neck and throat, which increased considerably during the following week, and left no room to doubt that, like its congeners, the blackness of the throat-feathers of summer is exchanged for white during the winter season" (Edinb. Phil. Journ. x. p. 96). It has been stated, although upon insufficient evidence, that this bird afterwards escaped.

In May, 1834, a Great Auk was taken alive at the mouth of Waterford Harbour by a fisherman named Kirby, who noticed the bird swimming about near him, and by tossing sprats to it, attracted it within reach of a landing-net, with which he secured it. Mr. J. H. Gurney, jun., states, upon the authority of notes from Dr. Burkitt, who subsequently obtained this example, that the details as given by Thompson are inaccurate, and the following appear to be the facts: —The immediate purchaser of the bird was Mr. Francis Davis of Waterford, who presented it to Dr. Burkitt in September, some days after its death, and but for the fact that the late Capt. John Spence, 89th Regiment, saw the bird at Mr. Jacob Goff's of Horetown (where he happened to be on a visit), and bespoke it for Dr. Burkitt in case it should die, it would probably have been lost to science, instead of being, as it now is, one of the treasures of the Museum of Trinity College, Dublin. Thompson's statement that "it frequently stroked its head with its foot," should read:— "This Auk stood very erect, was a very stately-looking bird, and had a habit of frequently *shaking* its head in a peculiar manner, more especially when any particularly favourite food was presented to it" (Zool. s.s. p. 1449).

The above appear to be the only authenticated instances of the capture of the Great Auk in the British Islands within the present century. These have been doubled by confused statements in various works; and there are also unsubstantiated records of the occurrence of this bird near Lundy Island; on the coast of Cork; and in Belfast Lough; in addition to one off Fair Island, between the Orkneys and the Shetlands, in June 1798, which is not improbable. Mr. John Hancock believes that a Great Auk was taken at the Farne Islands more than a century ago, and recorded in Wallis's 'Natural History and Antiquities of Northumberland,' i. p. 340 (1769 Ed.), as "The Penguin, a curious and uncommon bird presented to John William Bacon, Esq., of Etherstone, with whom it grew so tame and familiar that it would follow him, with its body erect, to be fed."

In the Færoes, Debes (1673) speaks of the 'Garfogel' as birds which he had several times had, and which were easily tamed, but would not live long inland; and Mohr (1786) says that some were caught there most summers; but in 1800 Landt states that these birds were then beginning to become more rare. Major Feilden (Zool. 1872, p. 3280) gives some further interesting details, amongst which are those of his interview with an old man, Jan Hansen, then eighty-one years of age, who was present at the capture of a single Great Auk, weighing nine Danish pounds, on a ledge at the base of the Great Dimon on the 1st of July, 1808.

Iceland, which has furnished the majority of the skins and eggs now existing in collections, seems to have been the latest resort of this species. Off the coasts of that island there were three skerries, each known by the name of 'Geirfuglaskér,' on all of which it has presumably bred, the best known and most productive being the one lying off Reykjanes, which was sporadically visited by the natives. In 1808 the crew of a privateer under British colours remained there a whole day, killing many birds and treading down their eggs and young; and it was probably this skerry which was visited on the 24th of August, 1813, by a schooner from the Færoes, sent to Iceland by Governor Löbner to obtain provisions for the starving inhabitants. Major Feilden gives the deposition of one of the crew, Daniel Joensen, taken down in 1858, when he was seventy-one years of age, from which it appears that either eleven or fourteen Gare-fowls were obtained, many more escaping to sea. Faber, on his visit in 1821, did not see any, although some were killed on the mainland about that period. In the spring of 1830 this skerry disappeared during a submarine eruption, and shortly after it was discovered that there was a colony on a rock known as Eldey, or the Meal-sack, between the sunken skerry and the mainland, where the birds had not previously been known to breed. During the next fourteen years systematic expeditions were made to this spot: about sixty birds and a number of eggs being procured, the majority of which were sent either to Copenhagen or Hamburg. The last two birds were taken alive there early in June, 1844, and were sent to the Royal Museum at Copenhagen, where preparations of their bodies may be seen preserved in spirits. Since that date no examples are known to have been obtained, and the faint hope may now be abandoned that a remnant might have taken refuge on the Geirfugladrángr, a lonely islet hitherto protected from the invasion of man by the dangerous surf which encircles it.

On the east coast of Greenland, which in recent times has been rendered almost inaccessible by a change in the drift of the polar ice, it would appear from the researches of Preyer, that about the year 1574 an Icelander loaded his boat with Gare-fowls at some islands, since identified with Danell's or Graah's Islands in 65° 20′ N. lat. To the west coast it can only have been a straggler, and Fabricius, who was at Fredrikshaab in only 62° N. lat., speaks of it as excessively rare, and not known to breed there; adding "sed pullum vidi, mense Augusto captum, lanuginem griseam tantum habentem" (Faun. Groenl. p. 82; 1780): a description which hardly proves the accuracy of his identification. It is doubtful if the specimen in the University Museum at Copenhagen, said to have been obtained at Disco Island in 1821, was not really taken some years earlier at Fiskernæs, a considerable distance to the south of the Arctic circle. Inasmuch as the Great Auk has been erroneously associated in the popular mind with high northern latitudes, and as these misconceptions die hard, it may be repeated that, with the above questionable exception of Disco Island, and similar assertions respecting Grimsey, off the north coast of Iceland, there are no authentic records of the occurrence of the Great Auk to the north of, or even very close to, the Arctic circle.

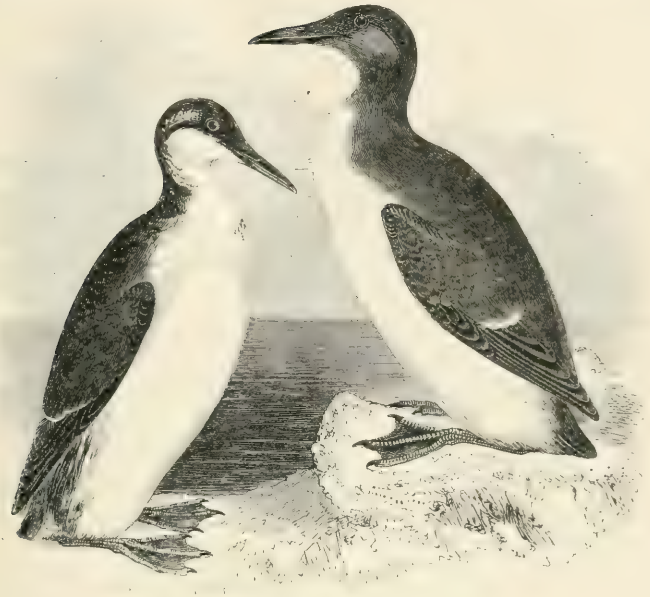
Nowhere was the Great Auk found in such abundance as in the neighbourhood of Newfoundland, where it received from the early voyagers the name of Penguin or Pin-wing, probably from the shortness of its wings, and not, as supposed by Clusius and others, from *pinguis*, fat. From Hakluyt's 'Voyages' it appears that numbers were found on 'the Island of Penguin' in 1536; and about forty years later the same collection of narratives furnishes more exact descriptions, adding that the French fishermen victualled themselves with, and salted down, these birds. In 'A Discourse and Discovery of Newfoundland, written by Captaine Richard Whitbourne of Exmouth, in the county of Devon,' published in 1620, it is stated (p. 9) that among the Water-fowl, which are very plentiful, are 'Penguins,' which "are as bigge as Geese, and flye not, for they have but a little short wing, and they multiply so infinitely, upon a certain flat Iland, that men drive them from thence upon a boord, into their boates by hundreds at a time, as if God had made the innocency of so poore a creature, to become such an admirable instrument for the sustentation of man." How long this slaughter continued it is impossible to say, but Anspach, writing in 1819, speaks of 'the Penguin' as exterminated in that quarter. In 1841, when Stuvitz visited Funk Island, about thirty miles from Newfoundland, he found quantities of the bones of this bird, and the remains of rude stone enclosures or 'pounds' into which the victims had been driven; in 1863 several natural mummies were procured and sent to Europe; and in July, 1874, Prof. Milne obtained remains belonging to at least fifty individuals in less than half an hour. It also existed on the coast of Labrador; and Catesby, in his 'History of Carolina, &c.' (1743), includes 'the Penguin' amongst the winter visitors to the waters of that State.

Such is briefly the history, apart from vague statements, of the Great Auk during the past three centuries. That it frequented the coast of Denmark in prehistoric times is shown by the discovery of its remains in the kitchen-middens of Jutland and Zealand, and there is even some evidence of its occurrence there so late as the beginning of the present century. In Scotland, Dr. Smith has described and figured the remains obtained in the middens of Caithness; some bones were recently discovered on the Island of Oronsay in Argyllshire (J. Linn. Soc. xvi. p. 479); and it is stated (N. H. Tr. Northumb. vii. pp. 361, 363) that remains of this bird were found in 1878 in some old sea-caves in the Cleadon Hills, Durham. In America its bones have been disinterred from the middens of Maine.

As regards the specimens of the Great Auk still existing in collections, various lists have from time to time been published by Professor Newton and others; the former tells the Editor that he estimates their number at seventy-seven skins or mounted birds, and there are sixty-nine egg-shells. In general coloration the latter resemble those of the Razor-bill, but some of them exhibit a distinctly green tinge, and an approach to the scrolling of the Guillemot; average measurements, 4·9 by 2·7 in.

In summer plumage the bill is black, very strong, compressed, and marked with several lateral furrows; the irides reddish-brown; between the beak and the eye an oval patch of white; head, chin, and throat, hind neck, back, wings, and tail black; the ends of the secondary wing-feathers white; breast, and all the under surface of the body white; legs, toes, and their membranes black. The whole length of the bird is thirty-two inches; the wing from the wrist to the end of the longest quill-feather seven inches; of the longest feather alone but four inches and a quarter.

Dr. Fleming's specimen had the chin, throat, and front of the neck white. Fox, in reference to the specimen in the Tunstall collection of the Newcastle Museum, says, "Our bird is apparently a young one, the neck black, spotted, or mottled with white; upper mandible of the bill with one large sulcus at the base, none at the tip" (Synopsis, p. 92).



URIA TROILE (Linnæus*).

THE COMMON GUILLEMOT,

WILLOCK, OR TINKERSHERE.

Uria troile.

URIA, *Brisson*†.—Bill of moderate length, strong, straight, pointed, compressed ; upper mandible slightly curved near the point, with a small indentation or notch in the edge on each side. Nostrils basal, lateral, concave, pierced longitudinally, partly closed by membrane, which is also partly covered with feathers. Feet short, placed behind the centre of gravity in the body ; legs slender, feet with only three toes, all in front, entirely webbed. Wings short, first quill-feather the longest. Tail short.

THE COMMON GUILLEMOT so closely resembles the Razorbill in the localities it frequents ; in the time of its movements ; in its manners, habits, and food ; in its general colours and appearance, and the seasonal changes of its plumage, that the history of the one species before given is to a great extent the history of the other, and repetition would be useless. It is, however, more numerically abundant, and its eggs are more systematically collected than those of any other member of the family, especially on the cliffs near Flamborough, one of its best known and most accessible breeding-stations. Colonies exist, unless extirpated by persecution, wherever there are cliffs with suitable ledges, throughout the British Islands; little more than forty years ago there was one at Cromer, and Mr. J. H. Gurney can remember the existence of one on the comparatively low shelves of Hunstanton, in Norfolk.

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* *Colymbus Troile*, Linnæus, Syst. Nat. Ed. 12, i. p. 220 (1766).

† Ornithologie, vi. p. 70 (1760).

Like the Razor-bill, the Guillemot lays only a single egg, but this is of large size, and very variable in colour, scarcely two being found precisely alike. It is generally of a fine bluish-green, more or less blotched and streaked with dark reddish-brown, or black; but sometimes these markings are distributed over a white ground-colour: often the eggs are of a plain green or white colour, without any streaks or blotches, and there is a rich reddish-brown variety which is comparatively rare; the form of the egg is that of an elongated handsome pear, measuring 3·25 in. by 2 in. in breadth at the larger end. The eggs of the Guillemot are readily distinguished from those of the Razor-bill, with which they are most likely to be mixed, by the length to which the smaller end of the former is drawn out. The gatherers of these and various other rock-birds' eggs at different parts of the coast let themselves down, or are let down by others, over the edge of the cliff with one or two ropes fixed to or hitched round a crow-bar driven into the ground above. These men, from practice, traverse narrow ledges of the rock, picking up the eggs along a path of only a few inches in breadth with steadiness and certainty. The Guillemot makes no nest, and the female sits in an upright position upon her single egg during incubation, which lasts nearly a month. It is, perhaps, unnecessary to combat the fanciful idea once prevalent, that the eggs are caused to adhere to the rock by some kind of glue-like secretion provided by the bird ; as a matter of fact, when the birds are suddenly and wantonly disturbed by the firing of a gun close to their breeding-places, the eggs may be seen to fall in showers, as the Editor has often witnessed at Lundy Island, where this disturbance, in order to show the number of rock-birds, is one of the amusements of the gaping tourist. So thick is the shell of the egg, that it often endures the contact with the water, and Mr. J. H. Gurney has a specimen dredged up at Lowestoft. It may be accepted as a fact that each bird recognizes its own egg, for Messrs. Theodore Walker and G. Maclachlan marked a number of birds on the ledges at Barra Head by splashing red paint over them, and the same individuals were found at their accustomed post day after day. Mr. Seebohm says that at Flamborough, Lowney the veteran cliff-climber is of opinion that if the egg is taken, the same bird will lay a second about nine days later, and this agrees with the experience of Mr. Maclachlan ; but if the second egg is taken the bird lays no more that season. If undisturbed, the same birds return year by year to the same ledge, and deposit their egg in the same spot, but if the eggs are taken the birds will shift their ground : it may be only to the next ledge. It is also pretty well established that the same bird lays a similar egg year after year. Large numbers of eggs collected at Lundy Island are taken to Bristol, where they are said to be used for clarifying wine ; and at Flamborough Mr. Cordeaux was informed that many were sent to Leeds, the albumen being employed in the preparation of patent leather. According to some good observers, the male does not take his share of incubation, nor does he feed the female when sitting, but perhaps this neglect of his apparent duties may not be universal.

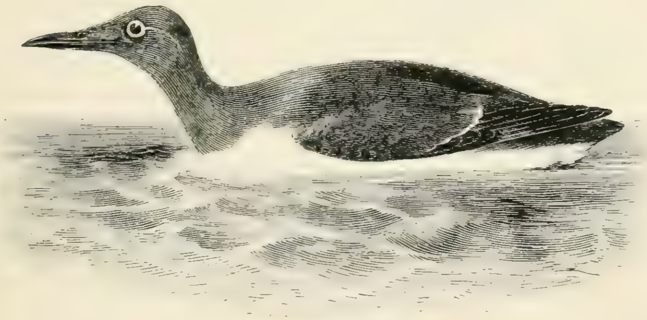
The young birds, at first covered with down, or bristly hair rather, from the manner in which it resists saturation with water, are fed for a time on the rocks by the parent birds with portions of fish. Mr. Waterton, in his account of his visit to the rock-bird-breeding localities about Flamborough Head, says, "The men there assured me that when the young

Guillemot gets to a certain size, it manages to climb upon the back of the old bird, which conveys it down to the ocean. Having carried a good telescope with me, through it I saw numbers of young Guillemots diving and sporting on the sea, quite unable to fly; and I observed others on the ledges of the rocks as I went down among them, in such situations that, had they attempted to fall into the waves beneath, they would have been killed by striking against the projecting points of the intervening sharp and rugged rocks; wherefore I concluded that the information of the rock-climbers was to be depended upon." Mr. Maclachlan, however, asserts that the young bird is grasped by the wing, near the shoulder, and is not, as a rule, carried down on the back of the parent. The cry of the young Guillemot is *willock, willock,* whence its local name, and the same is probably the origin of the French-derived appellation, Guillemot, for the adult: a term seldom employed by the fishermen and cliff-men, excepting when speaking to strangers. It is, strictly speaking, a Breton word; and as 'Gwillim,' we find the name in Welsh. In England the commonest is the onomatopoetic 'Murre,' from the murmuring noise of the assembled multitudes at their breeding-haunts; whilst with mere fishermen the bird is more frequently known as 'Scout,' perhaps from its short or 'cutty' tail; also as 'Marrock,' or 'Marrot.' By the end of August, or early in September, both parents and offspring have quitted the rocks for that year, and for a time remain both night and day on the open water, far from land, till the circle of seasons induces another visit to the rocks.

The Common Guillemot breeds in vast numbers in the Færoes, Iceland, Norway up to the North Cape and round it to the Varanger fjord; and, owing to the influence of the Gulf Stream, as far north as Bear Island; but the record of its occurrence in Spitsbergen appears to be an error, the only species found there being Brünnich's Guillemot. With the exception of Bornholm, it can hardly be said to have a breeding-place in the Baltic; there is a colony on Heligoland; and many exist on the northern and western coasts of France.

Southwards its winter range extends as far as the Canary Islands, but it seldom goes any distance up the Mediterranean. On the American side of the Atlantic it occurs regularly from New England in winter up to about 60° N. lat. in summer; and it has been obtained at Godthaab in Greenland about 4° further north. In the North Pacific it is represented by a closely allied and very doubtfully distinct form, *Uria californica*, Bryant.

In former Editions of this work the Ringed or Bridled Guillemot was figured and described with the concluding remark by the Author, that "opinions seemed fairly balanced as to whether this bird is a species or a variety." Since those lines were written the general opinion of ornithologists has inclined to consider it as merely a race with a tendency to develop an unusual amount of white encircling the eye and running along the crease or furrow which passes thence down the sides of the head. It inhabits the same localities, and is always found in company with the common species, but in far inferior numbers. At Lundy Island it is rare, so it is at Flamborough. On the Farne Islands, where the Editor had an opportunity of watching the breeding Guillemots at a very short distance, he observed several birds with well-developed eye-rings and streaks, sitting on their eggs, whilst others exhibited gradations from the above to the usual furrow with only a few white feathers at its junction



with the eye (Zool. 1866, p. x.) On Handa, off the coast of Sutherland, the Ringed variety is said by Mr. Harvie-Brown to be abundant as compared with other bird stations in Scotland, being in the proportion of about one in ten or twelve, and he has many times seen the Common and the Ringed birds paired. Major Feilden's experience in the Hebrides and the Færoes is to the same effect, and details of the observations of these two eminent ornithologists at Barra Head and on Mingalay, will be found in Mr. Gray's 'Birds of the West of Scotland' (p. 426). The assertion by Pastor Sommerfelt as to the large proportion of the Ringed form in the north of Norway, is contradicted by Mr. Collett, who emphatically states that every one of the individuals he was able to examine on the Stappen breeding-station near the North Cape, in June 1872, belonged to the original type. At Grimsey, to the north of Iceland, according to Mr. Procter, there is a considerable proportion of the Ringed variety; and there appears to be a general although not invariable increase in the number of this form towards the north. From Baird's 'Birds of North America' (p. 914), it would seem that this variation is equally found in the Pacific *U. californica:* a strong argument against the specific value of the white markings. On the other hand, Mr. Gatcombe informs the Editor that all the Ringed birds which he has examined appeared to have the apertures of the eye, when measured with the compass, larger than in the ordinary bird, and his views are entitled to much consideration. As regards the eggs laid by the Ringed form, they are undoubtedly liable to the same variations as those of the typical bird; and, upon the whole, the balance of evidence appears to show that the Ringed bird is merely a form of the Common Guillemot.

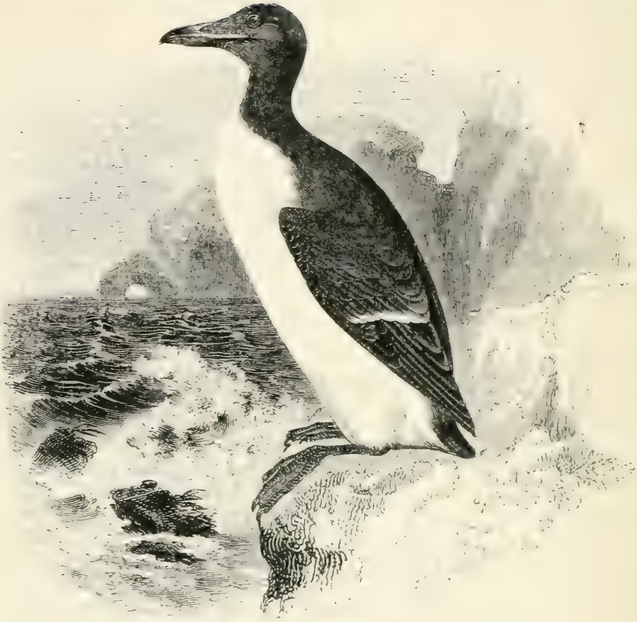
The Guillemot's evolutions in the water have of late years been exhibited to advantage in the tanks at the Brighton Aquarium, and at the Zoological Society's Gardens. Considerable force is exercised in diving, and the wings are used for propulsion under water, the course of the bird being marked by a line of small, silvery bubbles, and its immersion sometimes lasting more than half a minute. Its food consists of small fish and their fry, crustaceans and marine insects.

Guillemots have a partial moult in the spring, besides the entire moult in autumn, and while changing the wing-primaries they are said to be for a time wholly incapable of flight. In summer the bill is black ; the inside of the mouth orange ; the irides dark brown ; head and neck all round dark brown ; upper parts dark brown with a slaty tinge ; tail and wings, except the tips of the secondaries, sooty-brown ; lower part of neck in front, and all the under surface of the body pure white ; legs and toes dark brownish-black, the membranes olive. In winter the brown of the throat and sides of the head becomes white, with an irregular mottled band across the lower part of the throat. The whole length of a male bird about eighteen inches ; the wing, from the wrist to the end of the longest quill-feather, seven inches and a half. Females are rather smaller than males.

The young Guillemot, on its first appearance, has the down of the chin and the throat in front white, the neck in front below slightly varied with a few black hairs, which are lost on the bird's gaining its first true feathers ; upper parts dusky-brown.

The figure on the left hand in the illustration was taken from a young bird of the year, killed in its first winter ; in this state of plumage it resembles the adult in winter, but is distinguished by its smaller beak and the yellowish webs to its feet ; the throat remains white or mottled till the second spring-moult produces the appearance observed in our other figure, the ordinary plumage of summer.

Pure white and piebald individuals of this species are from time to time obtained. In the Proceedings of the Zoological Society for 1877 (p. 2), is an account of the exhibition by Prof. Newton of a bird shot near Poole by Mr. T. M. Pike on the 29th of November, 1876, and similar to the curious variety described by Dr. Krüper as once taken at Grimsey, off the north coast of Iceland ; the bill and feet being bright yellow, and the claws white.



Uria bruennichi, Sabine.*

BRÜNNICH'S GUILLEMOT.

THE THICK-BILLED GUILLEMOT.

Uria Brunnichii.

Brünnich's Guillemot is at once distinguished, at any season of the year, from the Common Guillemot by the shortness, stoutness, angularity, and greater depth of its bill, and in reference to this peculiarity it has been called the Thick-billed Guillemot: it is also of a much blacker colour on the upper parts. It was first described by Brünnich, in his 'Ornithologia Borealis' (p. 27), under the name of *Uria troille*, and an alteration of the specific term being necessary, the late Sir Edward Sabine named this Guillemot

* Trans. Linn. Soc. xii. p. 538 (1818).

after Brünnich, and gave some interesting details on its habits in his 'Memoir of the Birds of Greenland' (Linn. Trans. xii. p. 538).

This species has been included in the British list upon somewhat slight evidence. Thompson (B. of Ireland, iii. p. 213) adduces Sabine as an authority for its occurrence on the coast of Kerry, in July 1833, on the strength of a short notice of eleven lines in W. Ainsworth's 'Account of the Caves of Ballybunian,' App. A. p. 78 (1834). Sabine, however, merely says, "Of sea birds I recognised in flight * * * —of guillemots, the troile, Brunnichii, grylle and alba": the last word a misprint for "alle." Readers must decide for themselves whether even Sabine's identifications of the Brünnich's Guillemot and the Little Auk on the wing, can be trusted; but at all events no one has recorded those birds from the coast of Kerry in the breeding-season since his time. As regards a bird received from Youghal by Dr. Harvey of Cork, about the 1st February, 1850 (Thompson, *loc. cit.*), it seems possible that it really was a Brünnich's Guillemot, being described as "*very* black where that colour prevails." Sir J. C. Ross's statement (App. Narr. Second Voy., p. xliv.), "I have also met with it at Unst, the northernmost of the Shetland Islands, and in several parts of Scotland"; must be accepted with reserve, for neither by Saxby nor by any other competent ornithologist has it been found in Shetland up to the present time. As regards Orkney, all that Baikie and Heddle can say in 1848 is that one shot there several years previously was in the College Museum, Edinburgh: probably the same specimen of which Macgillivray says that he found it among some skins from Orkney belonging to the late Mr. Wilson, janitor to the University. The late Sir W. E. Milner asserted (Zool. p. 2059) that Brünnich's Guillemot was found breeding on the rock of Soa, St. Kilda, where one egg was taken; but the correctness of his identification, or rather that of Graham of York, may be questioned, inasmuch as no subsequent visitor has been able to see or hear of it. Equally unsatisfactory is Mr. Thomas Edward's bare statement (Zool. p. 6971) that this species "has been once met with" on the coast of Banffshire. A reputed specimen, identified by "the late Mr. Wilson of Woodville," is said to be in the collection of Mr. E. S. Sinclair of Wick, and to have been shot in Caithness (Gray's 'B. W. Scot.' p. 422); and Mr. Gray has examined one preserved by a birdstuffer at Hamilton, which was reported to have been obtained on the west coast of Scotland. Mr. A. G. More states, in 'Venables' Guide to the Isle of Wight,' Zoology, p. 34 (1860), that it "was obtained by Mr. Rogers, at Freshwater, Feb. 7th, 1860," but the resting-place of this rare example is not indicated. In Dr. Bullmore's 'Cornish Fauna' (p. 39), one is said to have been obtained off Rosemullion Head; but it is evident that Mr. Rodd was somewhat doubtful as to the correctness of the identification or of the occurrence; and the late Mr. Gould does not so much as allude to the species in the Introduction to his 'Birds of Great Britain.' The Rev. Churchill Babington has kindly sent, for the inspection of the Editor, an undoubted Brünnich's Guillemot, purchased at the sale of the Museum of Sudbury, Suffolk, where it formed part of a case of twelve 'British Aquatic Birds,' Lot 230, but although there is considerable reason for presuming that it was obtained near the mouth of the Orwell, there is no direct evidence on the point. Lastly, Mr. H. Blake-Knox says (Zool. s.s. p. 2609) that "in June [1870] an adult female was found floating off the Irish coast: the bird had been dead many days; I hardly call this a fair Irish bird." As this rare example was not too far advanced in decomposition for the sex to be distinguished, it is to be hoped that it was preserved, for whether Irish or not, it probably died "within the four seas." In 1876, Mr. J. H. Gurney, jun., published his analysis of the so-called British-killed Brünnich's Guillemots (Rambles of a Naturalist, p. 271), and since that date there seem to have been no further records.

Brünnich's Guillemot is in fact a northern species, which has not as yet been found on the Færoes, and only visits the coasts of Norway and the North Sea in winter, for Mr. Collett has never succeeded in finding a breeding-place, and

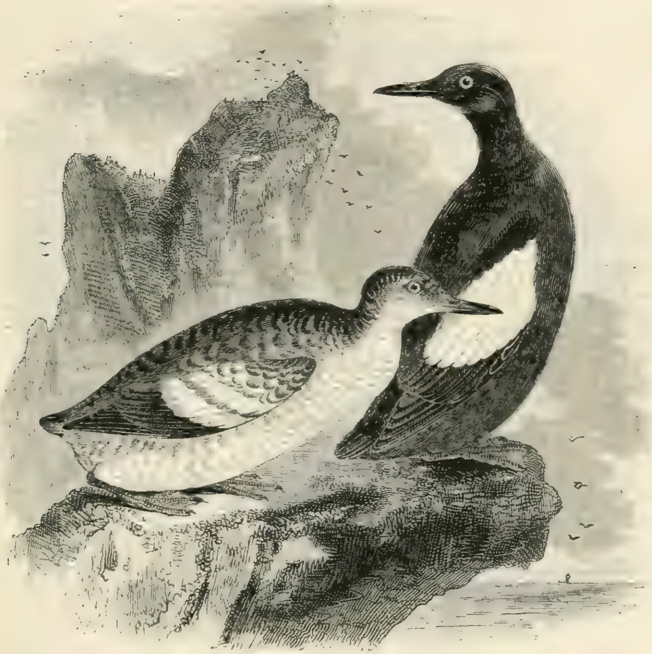
Nilsson's statement that it breeds on the Carlsöar, off Gottland, in the Baltic, requires confirmation. A straggler is said to have been obtained near Flensborg, and two, at long intervals, on the coast of Denmark; moreover, Mr. E. Hargitt's collection contains a specimen taken near Hâvre, in France. Even in Iceland it seems to be very local, and almost confined to the northern portion. In Greenland it is found in immense numbers, breeding as far south as 64° N. latitude. Major Feilden describes (Zool. 1878, p. 380) a visit to a vast colony or "loomery" in the cliffs of Sanderson's Hope, which rise over a thousand feet in height, a little to the south of Upernavik, and he observed two individuals in August as far north as Buchanan Strait, in 79° N. lat., after which this bird was not seen again until the return of the 'Alert' to navigable water, south of Cape Sabine, the north water of Baffin Bay being evidently the limit of its range in that direction.

On the cliffs of Spitsbergen, especially the Alkefjell, and on the neighbouring islands, it breeds in millions, and it is abundant on Franz-Josef Land, where Payer says it made its appearance on the 24th of May. It swarms on Novaya Zemlya, and probably occurs in suitable localities along the north coast and islands of Siberia, for Nordenskiöld saw it east of Cape Cheljuskin, and found half-grown young on the Preobraschenij Islands, in 116° E. long., on the 24th of August, during the voyage of the 'Vega.' He reports it as wintering in those Arctic regions, wherever open places occur during that season; and he obtained it at Irgunnuk on the 30th of April, 1879, while his ship was imprisoned in the ice. The naturalist of the 'Jeannette' found it breeding in abundance on Bennett Island; but in Bering Sea and in the North Pacific, down to Japan on the one side and California on the other, it appears to be replaced by a closely-allied form to which American naturalists apply the name of *Uria arra.* On the east side of America the winter range of Brünnich's Guillemot has been known to extend to New Jersey.

In its habits and food, so far as is known, this species does not differ from the Common Guillemot. The eggs are as a rule somewhat thicker and blunter, and in the green varieties the colour is perhaps a trifle brighter.

A specimen of the bird brought from Iceland by Mr. Proctor agrees exactly with Sir Edward Sabine's description of this species in its summer plumage. The beak is black, the posterior half of the marginal portion of the upper mandible nearly white, extending from the corner of the mouth to the point where the feathers project on the bill, and forming a very characteristic mark; the irides dark brown; throat sooty-brown, as in the Razor-bill; head, neck behind, back, wings, and tail black, with a greenish gloss; secondaries tipped with white, forming a bar across the wing; belly, and all beneath, pure white, running up to a point on the front of the neck; in the Common Guillemot the white colour ends here in the form of a rounded arch; legs and toes yellowish-olive on the upper parts, dark brown below; membranes brownish-black. The whole length is eighteen inches. From the wrist to the end of the longest quill-feather eight inches and a quarter. The sexes are alike in plumage, but the female is rather smaller than the male.

This species undergoes the same changes of plumage from season as the *U. troile.* Sabine remarks that specimens killed early in June had the throat and neck white, unmixed with black; towards the end of June the change was in progress, and by the second week in July, as many were found in perfect summer plumage, with black throats and necks, as were still in change. Adult birds lose their dark throat at the autumn moult.



Uria grylle (Linnæus*).

THE BLACK GUILLEMOT.

Uria grylle.

The Black Guillemot, a well-known species, is smaller in size than the Common Guillemot, and more confined to the northern parts of the British Islands; but, like other members of this genus, it is a bird of the open sea, frequenting the rocks for a limited period during the season of incubation, and only being found inland after severe weather. It is local, remaining all the year in such situations as suit its habits, or ranging southwards for a comparatively short distance in winter. Rodd only records two examples off Cornwall; its occurrences on the coasts of Devonshire, Dorsetshire, Hampshire, and Sussex are few and far between; nor can it be considered more than a casual visitant, principally in the spring, to the east and north-east coast. Pennant states that in his time it was known to breed at Llandudno and Anglesea, on the coast of Wales, and Montagu, writing in 1802, says that a few used to do so near Tenby, but the late Thomas Dix does not so much as mention the occurrence of this species in his 'Birds of Pembrokeshire,' in 'The Zoologist' for 1869. Mr. Kermode informs the Editor that it still breeds in small numbers in the Isle of Man. St. Abb's Head, in Berwickshire, and the Bass Rock have been enumerated as nesting-places, but Mr. Harvie-Brown did not see it on his recent visit to the former, nor did the Editor find it on the latter. A few have been said to breed on the Isle of May, in the Firth of Forth, but Mr. Agnew, the lighthouse-keeper, says that none have done so for the past sixteen years; nor is it certain that any breed in Buchan and other counties on the east side of Scotland, although there are undoubtedly some colonies in Sutherland. Along the whole of the western coasts, including both groups of islands, it is abundant; and in the Orkneys and the Shetlands the 'Tystie,' as it is called, is a familiar and characteristic species. In Ireland it breeds on Rathlin Island, and along the coasts of Antrim, Donegal, the western side and islands, and at some places in the south; but Lambay Island, Howth, and other points on the east coast are now almost, if not entirely, abandoned by it.

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* *Colymbus Grylle*, Linnæus, Syst. Nat. Ed. 12, i. p. 220 (1766).

The Black Guillemot breeds in the Færoes, Norway, Denmark, and in many places in the Baltic and the Gulf of Bothnia; visiting the waters of North Germany, the Netherlands, and Northern France in winter. It is common in Iceland; on both coasts of Greenland; in Cumberland Basin, and in Baffin Bay; the last observed by Major Feilden on the northward voyage of H.M.S. 'Alert,' being on the 2nd of September, 1875, in lat. 82° 27′ N. In the waters of Spitsbergen, Franz-Josef Land, and Novaya Zemlya, the place of our Black Guillemot appears to be taken by a closely-allied species, *Uria mandti*, which has a more slender bill, and the feathers which form the wing-spot are pure white without any black on the basal portion. If, however, the identification is correct, Nordenskiöld found our Black Guillemot nesting in long. 113° E.; the naturalist of the 'Jeannette' observed it in abundance on Bennett Island; and Mr. Nelson records it as numerous throughout Bering Sea. There it meets with its somewhat smaller congener *Uria columba*, in which the white wing-spot is divided by a triangular black patch, and the under wing-coverts are sooty-grey instead of white. Another species, *Uria carbo*, with a stouter and larger bill, no white patch on the wings, and altogether black, except some white loral feathers, inhabits the waters between Japan, Kamtschatka, and Alaska. The distribution of these species is somewhat puzzling, and is complicated by the fact that entirely black individuals have been observed in Atlantic waters (Zool. 1878, p. 376); and a bird, apparently *U. columba*, was obtained by Von Heuglin in the vicinity of Spitsbergen.

In its nidification the Black Guillemot differs from other members of the family, in that it lays two eggs, generally in crevices of the cliffs, or upon the bare ground under blocks of stone near the water's edge. Saxby says that he has also found them fifty or sixty yards inland, on grassy slopes strewn with rocks, but never in anything like a nest. No competent British ornithologist appears to have found more than two eggs as the produce of the same bird, but Audubon insists that three are not uncommon in North America, and Mr. Ludwig Kumlien to some extent confirms that statement. The egg is white, slightly tinged with green or blue, blotched, spotted, and speckled with ash-grey, reddish-brown, and very dark brown; average measurements 2·3 by 1·5 in.; and the yolk is of a very deep orange-red colour. The birds return to their accustomed haunts year after year, and both sexes share in the duties of incubation.

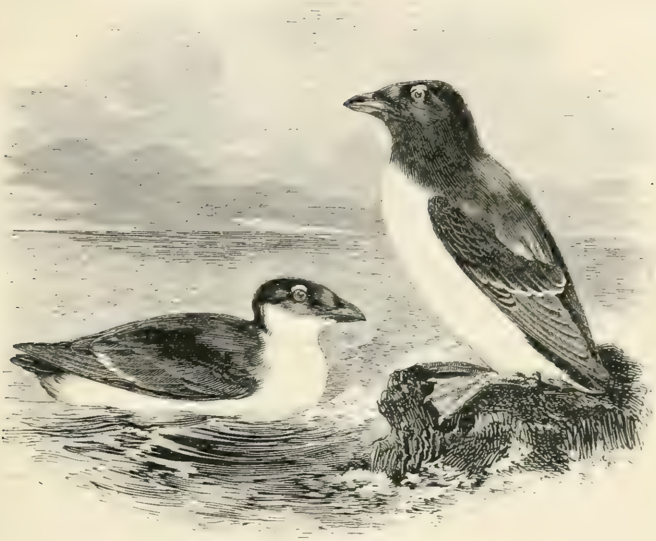
The first covering of the young bird is a greyish-black down, through which its first feathers make their way, and these are mottled black and white. Dunn and Saxby state, from observation in Shetland, that the young of this species never leave the nest until perfectly fledged, and able to provide for themselves; as soon as this takes place the attendance and care of the parents cease; they do not even continue in the company of their young, which associate together for some time afterwards. Their food is small fish and crustacea, and their cry is shrill but rather plaintive. Saxby adds that they are easily tamed, but almost invariably die before the end of the first winter.

In summer the beak is black; inside of the mouth reddish-orange; the irides brown; the whole of the plumage glossy black, except the patch on the wing-coverts, which is white, with some black concealed on the basal portion; legs vermilion-red. The sexes are alike in plumage. The whole length of the bird is fourteen inches; of the wing from the wrist six inches and a half.

In winter the inside of the mouth and the feet are less brightly coloured than in summer; the crown is white marked with black; back barred with black and white; rump nearly white; wings and tail as in summer; rest of plumage and underparts white.

In the young, at the end of August, the irides are dark brown; bill blackish-grey; inside of mouth pale orange; tarsi and feet deep brown, the front of former and upper surface of the latter paler. By the end of September the inside of the mouth has changed to brownish-pink, and the legs and feet to a deep brownish-pink. In December the colour of these parts differs only in degree from that in the adults. By the end of June the bird has acquired its full plumage, and is undistinguishable from the adult (Saxby).

Varieties of this species are occasionally obtained: Mr. J. Whitaker has one with sandy wings and the back of a lighter shade than that of the ordinary winter plumage.



MERGULUS ALLE (Linnæus*).

THE LITTLE AUK,

OR COMMON ROTCHE.

Mergulus melanoleucos.

MERGULUS, *Vieillot*†.—Bill shorter than the head, thick, broader than high at the base; culmen arched; upper mandible indistinctly grooved; under one with the symphisis very short and oblique; tips of both mandibles notched; commissure arched; nostrils lateral, round, situated at the base of the bill, and partly covered with small feathers. Legs abdominal, short; feet of three toes, all directed forwards, and united by a membrane. Wings and tail short.

THE LITTLE AUK, or Common Rotche, as it is also called, though in its habits very similar to the Guillemots and the true Auks, is only a winter visitor to the British Islands, and is more frequently met with among those of Orkney and

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[*] *Alca Alle,* Linnæus, Syst. Nat. Ed. 12, i. p. 211 (1766).

[†] Analyse, p. 67 (1816).

Shetland than further south. Somewhat intermediate in its characters between the Guillemots and the Auks, it has been considered worthy of generic distinction, and separated accordingly.

Truly oceanic in its habits, and, unless forced by necessity, rarely seen on land except in the breeding-season, this species usually makes its appearance on our coasts with, or soon after, the stormy weather which often follows each autumnal equinox, when it is forced by violent and long-continuing winds to leave the rougher sea and take shelter in land-locked bays, where it is easily shot. Individuals are not unfrequently driven while on wing over the land itself, far from their natural marine haunts, to situations where they are generally found either exhausted or dead. Some occur almost every year.

A remarkable instance of this sort occurred in the month of October, 1841. Dr. Edward Clarke, of Hartlepool, sent the Author word, that after a violent storm of wind from N.N.E., which lasted several days, his attention was directed by pilots and fishermen on the look-out, to various flocks of small black and white birds, then close in shore. There were several hundreds of them, which were unknown to these seafaring men, but which proved to be the Little Auk. Many were obtained, five or six being killed at each shot, the birds were so numerous. The same thing happened at the same time at Redcar, on the Yorkshire coast, but after two or three days, the wind abating, they were seen no more. About the same time the Author heard from various friends of other examples being taken in many different counties,—in Lincolnshire, Norfolk, Suffolk, Essex, Kent, and Sussex. During the early part of November, 1841, a few of these birds were sent for sale to the London markets. Some were taken at unusual distances inland. Mr. Thrale, a collector in Hertfordshire, sent notice of one that was obtained on the mill-head at Wheathamstead; and another, which was picked up alive between Baldock and Royston, is now preserved in the Museum at Saffron Walden. The Author heard of others taken near Birmingham; Strickland recorded nine taken in Worcestershire; three in Shropshire; some at Bristol, and other parts near the Severn. Since the above was written the Little Auk has been obtained all round the coast of England. In Scotland it is tolerably common on the east side, but decidedly a straggler, according to Mr. R. Gray, on the west; and in the Shetlands and Orkneys it is observed almost every winter. In Ireland, its appearance in Wexford and Kerry has been noted by Thompson; and it has been observed on other parts of the coast. There is no evidence that it has bred in any part of the British Islands, although examples are occasionally obtained in full summer plumage. Mr. F. Bond has a fine specimen with full black throat, picked up dead in the Solent.

The Little Auk visits the Færoes, the coasts of Scandinavia, the North Sea, Germany, the Netherlands, France, the western side of the Iberian Peninsula, the Canaries, and the Azores. It is found round Iceland throughout the year, but its only breeding-place there appears to be on Grimsey, in the extreme north-west. About Bear Island, which, in spite of its comparatively high latitude, is, as before observed, under the influence of the Gulf Stream, the Little Auk is not common, nor is it known to breed; but in and about Spitsbergen its numbers are almost incredible from 73° N. lat. up to the drift ice, about which Parry found it up to 82°; it was also observed on Franz-Josef Land. It is common on the west side of Novaya Zemlya, but rare on the east, and in the Kara Sea, which seems to mark the limits of its range in that direction. In Greenland it breeds from 68° N. lat. upwards, but although there are large colonies in Baffin Bay, it does not appear to extend to the western side, nor can its range be traced through the Arctic regions to the Pacific. In winter it visits the Atlantic coast as far as New Jersey.

The Little Auk deposits its single egg in holes or tunnels under stones, so far in that the Arctic foxes cannot reach it: often in cliffs up to 2 000 feet above sea-level; the colour is a pale greenish-blue, sometimes faintly spotted and scrolled with reddish; average measurements 1·9 by 1·25 in. At Foulke Bay, Major Feilden found the young just hatched on the 28th July. He describes this species as fishing for *Entomostraca*, flocks of them diving just in time to avoid the ship's stem. "These birds use their wings vigorously to propel themselves under water. It was observable that the individuals in a diving flock kept their relative distances and bearings under water with as much correctness as if on the wing, and all returned to the surface within a second of one another. During the breeding-season the pouch-like enlargement of the cheeks gives them a singular appearance. The contents of the cheeks is a reddish-coloured substance, which on closer examination is found to consist of immense numbers of minute crustacea. The adaptation of the mouth in this species, as a receptacle for the food required for their young, does not appear to have attracted much attention among naturalists; and yet a little consideration would have shown that some such arrangement must be required. With fish-feeders, such as *Alca*, *Uria*, and *Fratercula*, no difficulty arises in transporting food to their young; but in the case of *Mergulus alle*, which, I believe, subsists entirely on minute crustacea, the bill is manifestly incapable of conveying the requisite amount of food, especially as very often the breeding-places of the Little Auk are found inland, at considerable distances from the sea. This bird does not appear to be possessed of great powers of flight, or capable of making headway against a gale: this will account for its having often been picked up in an exhausted condition far inland. In autumn Little Auks were migrating southwards in immense numbers from Davis Strait: probably these flocks were bound for the Labrador and Newfoundland coasts, for I did not observe them later on during that voyage in the Atlantic to the eastward of the longitude of Cape Farewell" (Zool. 1878, p. 383).

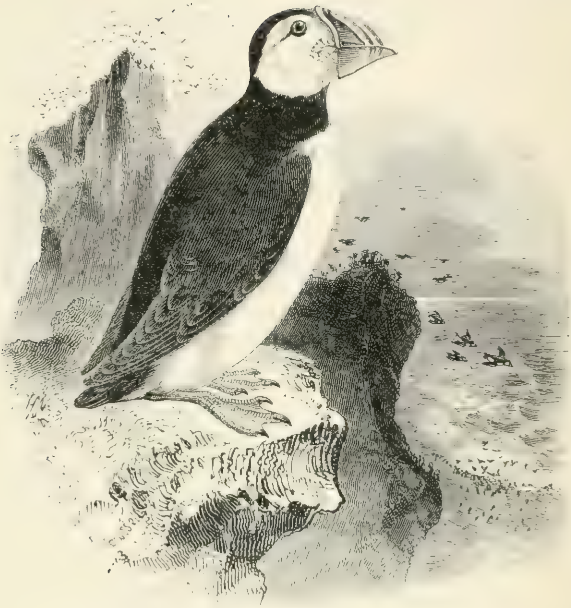
In the adult bird the beak is leaden-black; the irides hazel; a small white spot over the eye; the head, hind neck, back, wings, and tail black, but the ends of the secondaries and the sides of the scapulars margined with white; the colour of the chin, throat, and neck in front, depend on the season, being black in summer and white in winter, but mottled with black and white in spring and autumn; under surface of the body white; legs and toes livid-brown, the membranes between the toes darker brown. Sabine remarks, "The whole of the birds in the breeding-season, the sexes being alike, had the under part of the neck an uniform sooty-black, terminating abruptly, and in an even line against the white of the belly; the young birds, which we saw in all stages from the egg, as soon as they were feathered, were marked exactly as the mature birds; but in the third week in September, when we were on our passage down the American coast, every specimen, whether old or young, was observed to be in change; and in the course of a few days the entire feathers of the throat and cheeks, and of the under part of the neck, had become white."

The whole length of the bird is about eight inches and a half; of the wing from the wrist four inches and a half.

A nestling taken by Major Feilden on the 28th of July, 1875, is covered with down of a uniform sooty-brown, but when half-fledged the underparts are white.

An albino example of this species is in the British Museum.

In the oceans of the Southern Hemisphere there is a genus of small Petrels—*Pelecanoides*—the members of which bear a strong superficial resemblance to the Little Auk in size, form, colour, and mode of flight; but on close examination, they will at once be recognized by their tubular nostrils.



FRATERCULA ARCTICA (Linnæus*).

THE PUFFIN,

SEA PARROT, AND COULTERNEB.

Fratercula arctica.

FRATERCULA, *Brisson*†.—Bill shorter than the head, higher than long, very much compressed, both mandibles arched, transversely grooved, notched towards the point; the culmen as high as the top of the head, and with a cutting edge. Nostrils lateral, marginal, linear, naked, almost entirely closed by a naked membrane. Legs short, abdominal; feet with three toes only, all in front, united by membranes; claws curved. Wings and tail short.

THE PUFFIN is the sole representative in the Atlantic of a well-marked genus, whose three other members are confined to the North Pacific: the headquarters of the *Alcidæ*.

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[*] *Alca arctica*, Linnæus, Syst. Nat. Ed. 12, i. p. 211 (1766).

[†] Ornithologie, vi. p. 81 (1760).

It is a singular-looking bird, its aspect being rendered more peculiar by the form and colour of its bill, and a certain quaintness in its gait. As a rule it is a summer visitor to the British Islands, making its appearance early in April, and departing with great regularity by the end of August; but Mr. R. Gray states, that on the east coast of Scotland, especially in the Firth of Forth, the Puffin is never absent—the place of the local birds, which go southwards, being supplied by flocks from more northern regions; and on the west side it arrives at the beginning of February. Grassy slopes on cliffs, low islands covered with a short turf suitable for burrows, or masses of fallen rocks, are the places selected by Puffins for the great object of their visit, the reproduction of their species; and the localities in which they assemble in multitudes are too numerous to be mentioned. On the south coast their numbers have decreased, and comparatively few breed in the Isle of Wight and in the cliffs of Dorsetshire; nor do there appear to be many suitable localities on the south coasts of Devon and Cornwall. The Scilly Islands, to which they still resort in considerable numbers, appear to have been famous for Puffins in early times; for William Botoner, or Buttoner—commonly called William of Worcester—in his 'Itinerary' written in 1468 or 1478, speaks of the Island of Trescoe as inhabited "cuniculis et avibus vocatis *pophyns*" (Harting, Introd. p. xii. to Rodd's B. of Cornwall). Mr. Frederick Holme, of Corpus Christi College, Oxford, to whom the Author was indebted for many interesting notices on our British birds, sent the following:—"The Scilly Isles were held in the fourteenth century, under the king as Earl of Cornwall, by Ranulph de Blancminster for an annual payment of six shillings and eight pence, or three hundred Puffins at Michaelmas."* Myriads burrow in the slopes of Lundy Island, which, in fact, owes its Scandinavian name (*lunde* puffin, *ey* island) to the birds found there by the northern rovers who once made it their residence. Priestholm, off the coast of Anglesea, is another well-known haunt, and there are many others in Wales ; also in the Isle of Man. On the east side of England the Flamborough cliffs in Yorkshire, and the Farne Islands, are the only localities known. In Scotland the breeding-places of this species are very numerous, and the same may be said of Ireland.

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* Probably salted or dried birds for fresh ones would not be obtainable.

Early in May these birds deposit their single large egg, sometimes in crevices and fissures in the perpendicular surface of the cliffs, at the depth of three or four feet from the front. Rabbit warrens are not unfrequent on our coast, and it is said that the Puffins often contend with the rabbits for the possession of some of the burrows. Many Puffins, Mr. Selby observes, "resort to the Fern Islands, selecting such as are covered with a stratum of vegetable mould ; and here they dig their own burrows, from there not being any rabbits to dispossess upon the particular islets they frequent. They commence this operation about the first week in May, and the hole is generally excavated to the depth of three feet, often in a curving direction, and occasionally with two entrances. When engaged in digging, which is principally performed by the males, they are sometimes so intent upon their work as to admit of being taken by the hand, and the same may also be done during incubation. At this period I have frequently obtained specimens, by thrusting my arm into the burrow, though at the risk of receiving a severe bite from the powerful and sharp-edged bill of the old bird. At the further end of this hole the single egg is deposited, which in size nearly equals that of a Pullet. The length is two inches three lines, by one inch and seven lines in breadth. Its colour when first laid is white, sometimes spotted with pale cinereous, but it soon becomes soiled and dirty from its immediate contact with the earth, no materials being collected for a nest at the end of the burrow. The young are hatched after a month's incubation, and are then covered with a long blackish down above, which gradually gives place to the feathered plumage, so that, at the end of a month or five weeks, they are able to quit the burrow and follow their parents to the open sea. Soon after this time, or about the second week in August, the whole leave our coasts." Mr. Theodore Walker says (Zool. 1871, p. 2427) that when the young are hatched the old bird goes to sea and catches "soils," or young herrings, not exceeding an inch in length, and carries them by their heads, the tails projecting on each side of the bill, sometimes taking as many as twenty at once. Proceeding to the hole it lays down all the fishes, and gives the young bird one at a time until they are all eaten. When the female is sitting the male feeds her in the same way. The young are generally three weeks old before they are seen at the entrance of their holes; they can then run as fast, or even faster, than their parents, and being enticed down to the sea by the old birds, they leave the island in three or four days.

Puffins when on land rest on the whole length of the foot and heel, as represented in the illustration, and walk in consequence with a waddling gait; but they fly rapidly, and can swim and dive well. They feed on marine insects, small crustacea, and young fish, and they will go long distances—Mr. Maclachlan says fifty miles—for their food. He often saw these and other rock-birds going straight for Skerryvore lighthouse early in the morning when he was extinguishing the lights on Barra Head; and so regular was their return that the natives coming from marketing in Tobermory used to follow their flight when fogs came on, with the certainty of being piloted to Barra Head or Mingalay. During stormy weather these birds not unfrequently become victims, and after a continuance of severe gales there are generally some records in the papers of Puffins having been picked up far inland.

The Puffin is the most abundant of all the rock-birds visiting the Færoes; there are vast colonies on the coast of Norway, especially north of the Arctic circle; and it is also common in Iceland. In the waters of Spitsbergen, in small numbers compared with those of other members of the family, there occurs a large form—notably so as regards the bill—which has been distinguished by some ornithologists by the name of *Fratercula glacialis*, and it is probably this form which occurs sparingly in Novaya Zemlya, and more abundantly on the coast of Greenland up to 70° N. lat. Southwards our form breeds on the Atlantic coast of America down to the Bay of Fundy, migrating in winter as far as Massachusetts. Returning to Europe: we find the Puffin breeding on many of the small islands in the Channel group, and on the coast of France, especially off Brittany. From observing large numbers in the vicinity of the rocky Berlengas Islands, near the mouth of the Tagus, on the 8th of June, 1868, the Editor suspected that they bred there, and this has since been proved to be the case. In the Mediterranean, as far east as Sicily, the Puffin is not uncommon in winter; and as it has been obtained as late as the 27th of May, it is possible some may breed on the smaller islands of that sea. In the North Pacific this species is replaced by *Fratercula corniculata*, which has a horny growth on the upper eyelid, and the black band of the throat extends to the base of the bill.

In the Puffin, in summer, the basal ridge of the beak is yellow, the space in advance of the base bluish-grey, with three grooves and four ridges of orange; the naked skin at the gape yellow; the irides grey, eyelids orange; lore, chin, cheeks, and ear-coverts white; forehead, crown, occiput, a collar round the neck, all the back, wings, and tail, black, the wing-primaries rather the lightest in colour; all the under surface of the body white; legs, toes, and their membranes orange. The female has a somewhat smaller bill than the male. In size there is considerable variation between specimens from the south and those from the far north. The average length of those from Great Britain is twelve inches, and of the wing six inches; but in Spitsbergen examples the wing is sometimes seven inches in length, the bill being of proportionately large dimensions, and there appear to be gradations between the two extremes.

The young bird differs from the adult in having the bill smaller and not so high, the sides of the head are deeper grey, and the space in front of the eye is sooty-black. In some cases the dark face is still retained when the bird begins to breed in its third year.

It had long been remarked, without any satisfactory explanation being offered, that the old birds had much smaller bills in summer than in winter. Owing to the investigations of Dr. Louis Bureau,* it is now established that our Puffin sheds portions of its bill and the palpebral ornaments in autumn, the horny frontal sheath scaling off in pieces like plates of armour, and being accompanied by atrophy and loss of colour. Analogous changes have subsequently been observed in several of the North Pacific species of the family.

Varieties, more or less piebald, are not very uncommon, and nearly perfect albinos are occasionally met with.

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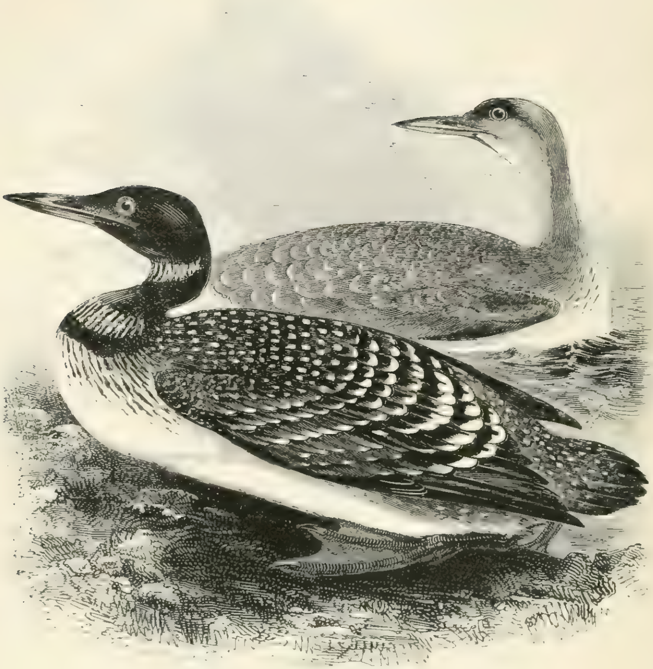
* Bull. Soc. Zool. de France, 1877, pp. 377–399; of which an abridged translation was published in 'The Zoologist,' 1878, p. 233.



COLYMBUS GLACIALIS (Linnæus[*]).

THE GREAT NORTHERN DIVER.

Colymbus glacialis.

COLYMBUS, *Linnæus*[†].—Bill about as long as the head; strong, straight, rather compressed, pointed. Nostrils basal, lateral, linear, perforate. Legs thin, the tarsi compressed, placed very far backwards, and closely attached to the posterior part of the body; toes three in front, united by membranes, one toe behind, with a small membrane, articulated upon the tarsus; the claws flat. Wings short, the first primary quill-feather the longest. Tail short and rounded.

OF the genus *Colymbus*, which is confined to the Northern Hemisphere, there are three British species, called Divers,

[*] Syst. Nat. Ed. 12, i. p. 221 (1766).

[†] *Tom. cit.* p. 220. Linnæus included in his genus the Guillemots and the Grebes.

par excellence, since they possess this power in a most marked and perfect degree. Except during their breeding-season all the Divers live chiefly at sea, where they obtain their living by following or keeping in the vicinity of shoals of herrings, sprats, and other species of fishes of moderate size, which they catch with great ease and certainty while diving. They remain under water a very considerable time without any apparent inconvenience, and have been taken, while thus submerged, by a baited hook, and in the meshes of nets.

Of these three, the Great Northern Diver, frequently called the Immer—or Ember—Goose, is the largest in size, and is of regular occurrence in our waters; but young birds are much commoner than matured examples. The former come closer to the shore and are more easily obtained; but the old birds keep, as a rule, to the open portions of the sea, and even when seen are so wary that they seldom allow of a near approach. There are, however, exceptions; for instance, in the winter of 1854 an adult Northern Diver unexpectedly made its appearance in the very middle of the inland county of Wiltshire, where it was first observed swimming majestically to and fro on a pond at Spye Park, and was afterwards caught in a ditch; and other occurrences of a similar nature are on record.

This species is sometimes very abundant on the coasts of Cornwall and Devon, and throughout the open sea at the mouth of the Channel; adults being more frequently observed there than in the narrower waters, or on the east coast. Mr. Gatcombe informs the Editor that on one occasion, towards the end of winter, he counted no less than thirty birds, apparently in pairs, in Plymouth Sound; and during the winter of 1874-75 they were unusually numerous. In October, and again in spring, birds in full breeding-dress are sometimes observed on the coasts of England; and in Scotland, especially on the western side, they are not unfrequent. Mr. R. Gray says that this Diver is abundant in the Outer Hebrides at all seasons of the year, except the month of July, and a few remain in Benbecula all the summer, although the nest has not as yet been found there. Dr. Scouler informed him that he had seen from fifty to sixty of these birds in groups of six or eight, preparing to quit the coast for their breeding-stations; and by the end of August they are back again accompanied by their young ones, little larger than a Mallard, so that their nesting-places cannot be at any great distance. On the 5th of June, 1868, Mr. Harvie-Brown watched a pair on a loch in the district of Assynt, Sutherlandshire, and although absolute proof is wanting, few who read his account (Zool. s.s. p. 1309) will have any doubt that the birds were breeding there. It is not known with certainty that the Northern Diver nests in the Orkneys; nor is there perfectly conclusive evidence that it does so in the Shetlands, although there are substantial grounds for the supposition. The late Dr. Saxby obtained eggs from Yell (accompanied by an accurate description of the bird), which agreed very closely with Hewitson's figure as regards their length, although two of them were about a line less in breadth: dimensions far exceeding those of the eggs of the Red-throated Diver, the only other member of the genus ever found in those islands; for, strange as it may appear, the Black-throated Diver, which occasionally lays eggs as large as those of the present species, is unknown in Shetland. In July, 1879, the Editor saw an adult Northern Diver in Sommer-voe, and a few hours before he left Lerwick, on the 28th of that month, he was assured on good authority that a very young one had just been brought in alive by the small steamer which visits the northern islands (Zool. 1880, p. 5).

In Ireland the Great Northern Diver is stated by Thompson to be a regular winter visitant to the coast, remaining from five to six months, and it is occasionally met with in summer.* On the 28th of May he watched an adult bird, the collar round the neck and the markings on the back being apparent, fishing within shot of the shore near the village of Glenarm, and he timed the bird's diving, the duration of immersion being just one minute. Fresh-water loughs are not unfrequently visited by this species; and there are many instances of its occurrence in inland waters in various parts of the United Kingdom.

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* Between the 6th and 21st of last June, while these pages were in the press, four adults, in full nuptial dress, were brought into Belfast.

This species visits the Færoes, although it has not been known to breed there, and it is abundant on the coast of Norway from autumn to spring, a few pairs being believed by Mr. Collett to nest on the shores of the fresh-water lakes on the holms and islets. Up the Baltic it appears to be rare, and in Northern Russia its range can hardly be traced beyond the White Sea. On migration this Diver occurs down to the Mediterranean, and for a considerable distance up that inland sea; also in the Black Sea; and immature birds visit the lakes and inland waters of the Continent nearly every year. Vernon Harcourt includes it in his list of the birds of Madeira.

Iceland appears to be the nearest locality in which the Great Northern Diver breeds in any considerable numbers, and there a pair or so may be found on nearly every lake. It occurs on both the east and west coasts of Greenland, breeding in the southern districts; and it is common in North America, nesting from about 70° N. lat. down to Connecticut. In winter it ranges southwards as far as the lakes of the table-land of Mexico. Westward it can be traced to the Pacific slope of the Rocky Mountains, where Mr. J. K. Lord obtained adults in full breeding plumage, which are in the British Museum, together with similar examples collected by Mr. Bernard Ross at Fort Simpson. From the latter place there are also adult specimens of a closely-allied species, *Colymbus adamsi*, which is a larger and more robust bird, with a bill of a pale yellow colour—instead of jet-black, as in our species—and with the under mandible much up-curved; the white spots on the back are very much larger, and the neck below the nape is purplish-blue, without any of the greenish tinge apparent in our bird. In the birds of each species found at Fort Simpson there are no gradations, but, on the contrary, their respective characteristics are most strongly defined, and, so far as the adults are concerned, there can be no difficulty in recognizing the two forms. It is, however, less easy to separate the immature birds, unless the sex of the specimen is known, for a young male of *C. glacialis* is as large as a young female of *C. adamsi.* Both species are said by Mr. E. W. Nelson to be found on the shores of the Arctic and Bering Seas, and the latter, which he considers to have a circumpolar distribution, is also found throughout the North Pacific, visiting Japan in winter; indeed its range appears to extend along the Arctic coast of Siberia, at least as far as the mouth of the Yenesei, where Mr. Seebohm was told of a species larger than the Black-throated Diver, which frequented the lakes of the 'tundras' and had a *white* bill. It has moreover been stated that *C. adamsi* occurs on the coast of Scandinavia; and an immature Diver, with a thickened and whitened bill, shot on the coast of Suffolk, and belonging to Mr. J. H. Gurney, was exhibited by Mr. Sclater at a meeting of the Zoological Society (P. Z. S. 1859, p. 206), and supposed to be an example of this species; it must, however, be remembered that in the young Great Northern Diver the bill is frequently of a pale horn-colour, and, in the male, of large dimensions.

During their breeding-season the Northern Divers frequent islands, in lakes and pools of fresh water, forming a flattened nest of dead herbage, among reeds and flags, from eight or ten yards to a distance of forty yards from the water's edge. The frequent passage of the birds to and from their nest to the water produces a path or track, by which the nest is sometimes discovered. Mr. Proctor thus notices what occurred to him, in reference to this species, on his visit to Iceland:—"It breeds on the lochs of fresh water about a day's journey from Mý-vatn; a single egg was deposited on the bare ground, but just out of water-mark, rather under a rugged bank on some broken ground. I was successful in finding two nests. I allowed the single egg to remain in one of them, in the expectation that another egg would be laid to it, but was disappointed. The old bird was very shy, and always left the egg on our approach, when at a great distance off, taking to the water and keeping so far from the side as not to be within shot."

The eggs are usually two in number, but Audubon says, in his account of this species, that in North America three are more frequently deposited. They are of a dark olive-brown, with a few spots of umber-brown; average measurements, 3·5 by 2·25 in. The female when on her nest lies flat upon her eggs, and if disturbed by the too near approach of an intruder, makes her way to the water by scrambling, sliding, and pushing herself along, occasionally running with the body inclined forwards; the thighs being closely attached to the hinder part of the body, the motion is principally confined to the tarsi and toes. The water gained, she immediately and invariably dives rather than flies off, sometimes using the wings under water. Though its wings are short, the flight of the bird is strong and rapid, but it usually resorts to diving to effect an escape.

Montagu, in the Appendix to the Supplement to his Ornithological Dictionary, says, "A Northern Diver taken alive, was kept in a pond for some months, which gave us an opportunity of attending to its manners. In a few days it became extremely docile, would come at the call from one side of the pond to the other, and would take food from the hand. The bird had received an injury in the head, which had deprived one eye of its sight, and the other was a little impaired; but, notwithstanding, it could, by incessantly diving, discover all the fish that was thrown into the pond. In defect of fish it would eat flesh. It is observable that the legs of this bird are so constructed and situated, as to render it incapable of walking upon them. This is probably the case with all the Divers, as well as the Grebes. When this bird quitted the water, it shoved its body along upon the ground like a seal, by jerks, rubbing the breast against the ground; and returned again to the water in a similar manner. In swimming and diving, the legs only are used, and not the wings, as in the Guillemot and Auk tribes; and by their situation so far behind, and their little deviation from the line of the body, it is enabled to propel itself in the water with great velocity in a straight line, as well as turn with astonishing quickness."

Nuttall, of Boston, who kept one for some time, gives the following account of its manners:—"A young bird of this species which I transferred to a fish-pond, made a good deal of plaint, and would sometimes wander out of his more natural element, and hide and bask in the grass. On these occasions he lay very still until nearly approached, and then slid into the pond and uttered his usual plaint. When out at a distance he made the same cautious efforts to hide, and would commonly defend himself in great anger, by darting at the intruder, and striking powerfully with his dagger-like bill. This bird appeared to suffer from the glare of broad daylight, and was inclined to hide from its effects, but became very active towards the dusk of the evening. The pupil of the eye in this individual, like that of nocturnal animals, appeared indeed dilatable; and the one in question often put down his head and eyes into the water to observe the situation of his prey. This bird was a most expert and indefatigable diver, often swimming under water, and, as it were, flying with the velocity of an arrow in the air. Though at length inclining to become docile, and showing no alarm when visited, it constantly betrayed its wandering habits, and every night was found to have waddled to some hiding-place, where it seemed to prefer hunger to the loss of liberty, and never could be restrained from exercising its instinct to move onwards to some secure or more suitable asylum."

The natural food of this Diver is fish and crustaceans, and some pebbles and gravel are generally to be found in the stomach. In pursuit of its prey it has been known to descend to great depths: An example in nearly full summer-dress, given to Mr. Gatcombe by Mr. Stephen Clogg of Looe, was caught in the meshes of a trammel-net *thirty fathoms* below the surface of the water. Its cry is a most weird and melancholy howl, frequently uttered at night; it also emits a low croak.

The bird in its fully adult plumage has the beak black;

the irides red; head, cheeks, and back of the neck black, the first with some tints of rich brown, green, and blue; the back also black, but most of the feathers ornamented with spots of white upon the black, those on the back with small square-shaped spots, the scapulars and tertials with larger white spots, which are also square, one on each side the shaft of the feather, forming transverse lines, the tertials also ending in white; on the wing-coverts, rump, and upper tail-coverts the white spots are small; primaries and tail-feathers uniformly black without spots; chin and neck in front deep black, varied with two bands of white, spotted with black; from these marks this species is sometimes called the Ring-necked Diver; lower part of the neck in front white, with short longitudinal stripes of black upon white on the sides; breast and under surface of the body white; sides under the wing and the flanks greyish-white; axillaries white with brown central streaks; legs, toes, and their membranes nearly black on the outside, lighter on the inner side.

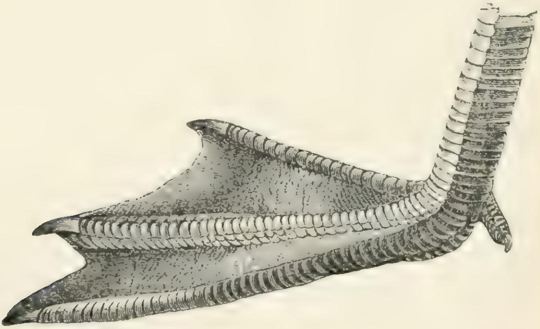
The whole length is from thirty to thirty-three inches. From the carpal joint to the end of the wing thirteen inches and three-quarters to fourteen inches. Males have been taken weighing eleven and even twelve pounds, but the females are much smaller.

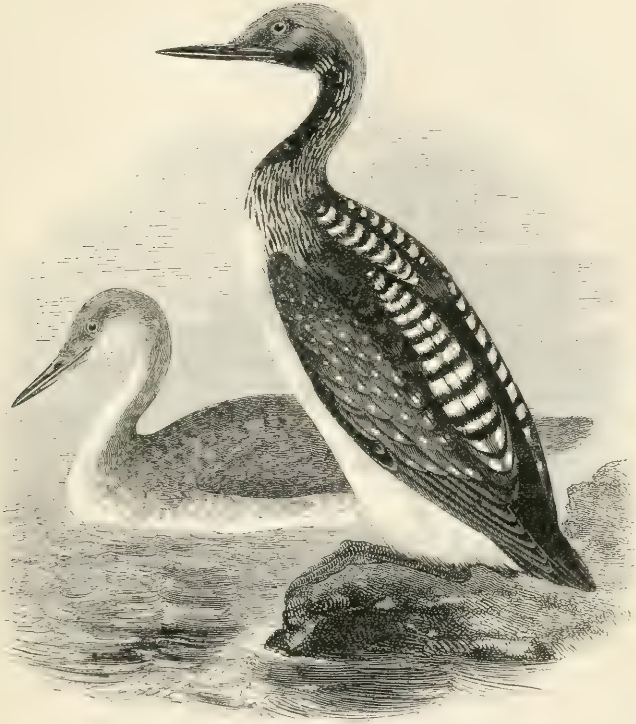
At the autumn moult the adults appear to lose their black throat-bands for a time, although it seems probable that in vigorous mature birds these ornaments are reassumed at an early date. Mr. Gatcombe once examined an adult Northern Diver in the middle of winter, the markings on the back and scapulars of which formed spots similar to those of summer, but were rather obscure and of an ash-grey instead of white, and not wavy like those of an immature bird, which fact leads him to suppose that it may be the true adult winter plumage of this species. A bird shot at Exmouth on the 9th of December is described by Mr. Cecil Smith ('B. Somersetshire,' p. 540) as having the throat white with the black encroaching and nearly joining in front towards the bottom; the feathers of the back and scapulars are in an evident state of change, some of them being quite as black and the spots on them as purely white and distinct as in the summer-dress; the rest of the feathers black towards the base, margined with dullish-grey; the places where the white spots either have been or will be, are distinctly marked; the rump, tail-coverts, tail, and back of the thighs are not so much in a state of change, being black with small white spots as they are in the breeding-dress. A specimen shot on the 19th of December was still more advanced towards the nuptial garb about the head and throat.

A young male, nearly full grown, killed in the winter, has the beak of a brownish-white horn-colour; irides reddish-brown; head, back of the neck, and all the upper surface of the body greyish-black; all the feathers on the back broadly edged with ash-grey; chin, neck in front, and all the under surface of the body dull white; outer surface of the legs and toes dark greenish-brown; edges and inner surface lighter greenish-brown; the whole length thirty-one inches; of the wing thirteen inches and a half.

The nestling is covered with a stiff down, sooty-black on the upper parts, paler on the throat, and greyish on the abdomen.

The figure below represents the form of the foot in this genus of birds.





COLYMBUS ARCTICUS, Linnæus.*

THE BLACK-THROATED DIVER.

Colymbus arcticus.

OF the three species of the genus *Colymbus* known in England, the Black-throated Diver is the most rare, occurring but seldom on the southern shores. Young birds have been taken in winter in Cornwall and Devonshire, but Mr. Gatcombe says that he has never seen an adult obtained there; in Somersetshire, however, one slightly changing to winter plumage is recorded by Mr. Cecil Smith as killed at Williton in December, 1875. In the London market the young are occasionally to be met with, and during the winter of 1836 Mr. Bartlett purchased two birds, one of which, an adult with a fine black throat, was obtained in the month of January; the other was a young one. Mr. S. Mummery, of Margate, sent the Author notice that a beautiful specimen was captured on the 2nd of June, 1842, in Sandwich Haven, and this, being a very fine male bird, was preserved, and deposited in the museum at Margate. The late Rev. Richard Lubbock stated that in the year 1832, a fine pair, killed on one of the broads of Norfolk, formed part of the collection of Mr. Penrice; but most of the examples of this species have been obtained in winter, and were young birds. To the shores of Lincolnshire, Yorkshire, Durham and Northumberland, the Black-throated Diver is a rare winter visitant. In 1830, a fine mature specimen was killed at the mouth of the Tweed, and several young birds on different parts of the coast, and upon the river Tyne. Selby, after examining the bird from which Thomas Bewick engraved the figure of his Lesser Imber, had no doubt that it is the young of the year of this species. More recently examples of this bird have been obtained on many parts of the coast, and also inland.

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* Syst. Nat. Ed. 12, i. p. 221 (1766).

To Ireland this Diver has always been a rare visitor, and Thompson only records two authenticated instances; to which may be added one mentioned by Mr. R. Warren (Zool. 1877, p. 329), a bird exhibiting the full black throat, seen at the mouth of the Moy in April, 1851, and several observed by Mr. H. L. Cox near Dublin in winter and spring (Zool. 1879, p. 484).

In Scotland the Black-throated Diver was first proved to be a breeding-species by the late Mr. Selby and Sir William Jardine in 1834, and the former gives the following account of their discovery:—"When in Sutherlandshire we found this species upon most of the lochs of the interior. The first we noticed was at the foot of Loch Shin, where we were so fortunate as to find the nest, or rather the two eggs, upon the bare ground of a small islet, removed about ten or twelve feet from the water's edge. The female was seen in the act of incubation, sitting horizontally, and not in an upright position, upon the eggs. In plumage she precisely resembled the male, and when fired at immediately swam, or rather dived off to him at a short distance. Our pursuit after them was, however, ineffectual, though persevered in for a long time, as it was impossible to calculate where they were likely to rise after diving. Submersion frequently continued for nearly two minutes at a time, and they generally reappeared at nearly a quarter of a mile's distance from the spot where they had gone down. In no instance have I ever seen them attempt to escape by taking wing. I may observe that a visible track from the water to the eggs was made by the female, whose progress upon land is effected by shuffling along upon her belly, propelled by her legs behind. On the day following, Saturday, the 31st of May, Mr. J. Wilson was fortunate enough to find two newly-hatched young ones in a small creek of Loch Craggie, about two and a half miles from Lairg. After handling and examining them, during which the old birds approached very near to him, he left them in the same spot, knowing that we were anxious to obtain the old birds. Accordingly on the Monday morning we had the boat conveyed to the loch, and on our arrival soon descried the two old birds attended by their young, and apparently moving to a different part of the loch. Contrary to their usual habit at other times, they did not attempt to dive upon our approach, but kept swimming around their young, which, from their tender age, were unable to make much way in the water, and we got sufficiently near to shoot both of them through the neck and head, the only parts accessible to shot, as they swim with the whole body nearly submerged. The female could only be distinguished from the male by a slight inferiority of size, and both were in the finest adult, or summer plumage. We afterwards saw several pairs upon various lochs, and upon Loch Kay [*sic*] a pair, attended by two young ones nearly half grown. When swimming, they are in the constant habit of dipping their bill in the water, with a graceful motion of the head and neck."*

Since the above was written, the Black-throated Diver has been found by Mr. Harvie-Brown and others to be even more plentiful in the south-western portion of Sutherland than the Red-throated Diver, although in the northern and eastern districts the latter species preponderates. Mr. R. Gray adds that a number of pairs take up their summer quarters on the lochs of Argyllshire, Perthshire, Inverness-shire, and Ross-shire; and on almost every loch in the Outer Hebrides there are to be found one or two pairs breeding. They seem to come near the shore in May and remain a short distance from land, travelling northwards, especially on the west coast; and he has seen both old and young birds on Benbecula in September.

The Black-throated Diver occasionally breeds on some narrow spit on the shore of a loch, but the favourite site is a green grass-grown island. The nest is a hollow in the ground, rarely with any lining, and situated near the water's edge. Mr. Harvie-Brown says that when the female leaves the nest she floats gently on the surface of the water when undisturbed, but if alarmed, she almost instantaneously dives, or should the water close to the shore be too shallow to admit of this, she half swims, half dives, until she finds sufficient depth, splashing up the water and making a noise which can be heard at a considerable distance. On several occasions with a good glass he has watched the female as she sat on her eggs, whilst the male swam up and down at no great distance, gracefully dipping his bill in the water, or lying over on his side stretching out his leg the better to preserve his balance, and then preening the feathers of his breast and side with his long dagger-shaped bill. When alarmed, he would raise his head sharply, and gradually sink his body, till his back became level with the water, or entirely disappeared beneath it, leaving only the long snake-like head and neck exposed to view. If the danger then became more imminent, he would dive without leaving a ripple on the surface, and reappear far out upon the loch. The males of different pairs, when the females are sitting, often join company, and may be seen fishing together on another loch (Pr. N. H. Soc. Glasgow, ii. p. 123).

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* Edinb. New Phil. Journ. xx. p. 293.

The eggs, which are usually two in number, are sometimes laid before the middle of May, and if taken a second pair will generally be found in the vicinity a little later in the season. Their colour is of a dark olive-brown, thinly spotted with black and umber; the average measurements being 3 by 2 inches. The birds are very tenacious of their old breeding-haunts, and will not easily change to a new locality.

This species is scarcely known to visit the Færoes, and its occurrence has not been authenticated in Iceland or Greenland; but with these exceptions it is generally distributed in summer throughout the arctic and sub-arctic regions. The late Mr. Richard Dann sent the Author the following note:—"This beautiful Diver is widely and numerously dispersed over the whole of Scandinavia during the summer months, but it is most abundant in the northern parts. It breeds generally in the interior of the country on small islands, in the most secluded and retired lakes. In Lapland and in the Dofre Field mountains, it is found as high as the birch-tree grows. It makes its first appearance in the spring with the breaking-up of the ice on the lakes. Within twelve hours of open water being seen, this bird never fails to show itself. The eggs are generally two in number. They are of a very rank fishy taste, but much sought after by the Laps. After the young are hatched, both male and female are very assiduous in bringing them food, and at that period are much on the wing, and may be seen flying at a vast height, with fish in their beaks, from one lake to another; on arriving over the lake where they intend to alight, they descend very suddenly in an oblique direction. The cries of this Diver are very peculiar during the breeding-season, and may be heard at a great distance. This bird is very quick-sighted and difficult to approach, it takes wing with great reluctance, but dives incessantly, taking care to come up far out of shot. On the approach of winter the old birds retire to the west coast of Norway. They make their appearance in the southern parts but rarely. The young birds, however, migrate in considerable numbers to more temperate climes, and are found at that period in the open parts of the Baltic, in the Elbe, and on the coast of Holland."

Vast numbers of the Black-throated Diver are bred in Finland and Russia, and nests have been found on the German shores of the Baltic. On migration this species visits the coasts and inland waters of the Continent down to the Mediterranean, but south of the Alps it is by far the rarest of the family. Eastward it is found breeding across Northern Siberia to the Amoor, and in winter it is common in Japan. On the other side of the Pacific—where the birds are on the average rather smaller than European examples, and have consequently been distinguished by some American ornithologists under the name of *C. pacificus*—this Diver is generally distributed throughout the Fur countries to Hudson's Bay, on the shores of which it is common. Parry brought home specimens from Melville Peninsula; and Richardson says that the skins of this and the other species of Divers, being tough and impervious to wet, are used by the Indians and Esquimaux as an article of dress. Audubon states that it does not breed in Labrador, but that young birds are found in Texas from winter to April, the lines of migration following the course of the great rivers, as well as the coast.

In the adult bird, the beak is dark bluish-black; the upper mandible rather more decurved and the under one straighter than in the Great Northern Diver; the irides red; forehead dark grey, top of the head, and back of the neck light ash-grey; back, rump, and tail-feathers nearly black; interscapular and tertial feathers with a square patch of white on each side of the shaft, forming a series of transverse bars; wing-coverts black, with a few specks of white; primary quill-feathers black; chin and throat black, divided by a half collar of short white lines; sides and bottom of the neck streaked longitudinally with black and white lines; breast, belly, and all the under surface of the body, pure white:

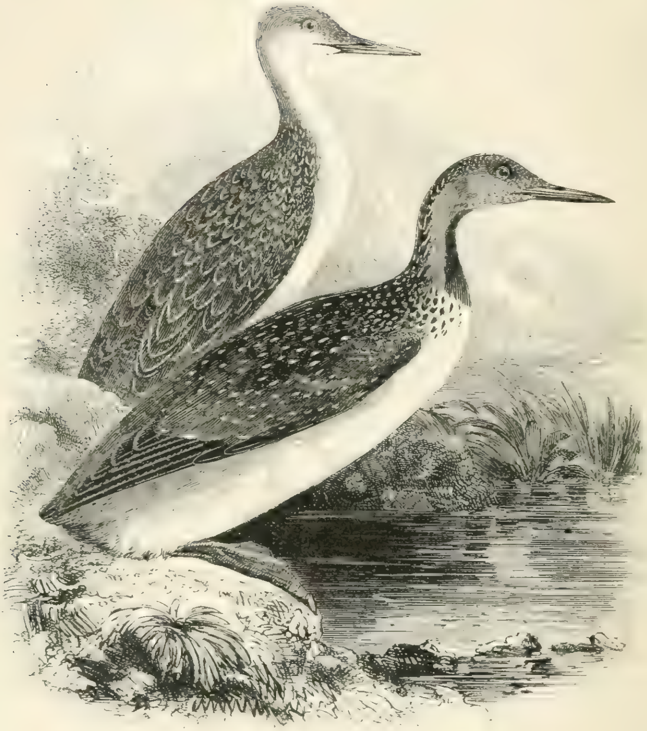
flanks and under tail-coverts dusky; legs and toes dark brown outside, lighter pale brown within. The whole length is about twenty-six inches; wing from the carpal joint to the end of the primaries, eleven inches and a half. Weight from 4½ to 5¾ lbs. Females are but little smaller than males, and both sexes, when mature, have the throat black. The Divers undergo a partial moult in the spring, and the black-throat on its first assumption is generally varied with a few white feathers.

A young Black-throated Diver obtained at Nagasaki on the 25th of December has the bill dark horn-colour; the upper part of the head and neck ash-brown; the part below the eye, throat, and underparts dull white; upper parts blackish, the upper wing-coverts showing small white spots as in the adult; axillaries white; flank-feathers ashy-brown.

Young birds measure twenty-three or twenty-four inches in length, and, except in size, they resemble the young of the Northern Diver; the back of the neck is, however, of a much purer grey, and there are none of the indications of the neck-bands noticeable in the latter.

The form and structure of the legs and feet in these Divers, and also in the Grebes, are worthy of particular examination. Though almost useless on land, these members are most efficient instruments in the water. The bones are broad and flat, and almost as thin as the blade of a knife; when the backward stroke in swimming is given, the whole surface of all these bones and their investing membranes is brought to bear against the water; but when the leg is to be brought forward again to renew the impulse, the sharp edges only are opposed to the fluid, and the position, as well as the partially-rotatory motion, remind the observer of the action of oars in rowing when used by skilful hands. Those who have the opportunity of examining the legs of a Diver, in a recently-killed specimen, while all the parts retain their perfect flexibility, will find a beautiful example of animal mechanics.

PYGOPODES. *COLYMBIDÆ.*



Colymbus septentrionalis, Linnæus.*

THE RED-THROATED DIVER.

Colymbus septentrionalis.

The Red-throated Diver is the smallest species of the genus, as well as the most common; immature birds especially, and adults with the white throats of the winter plumage in smaller numbers, being found on the coasts of the British Islands from autumn to spring; in fact, some individuals which have not gone northward to breed, may be met with out at sea in every month of the year. Mr. Gatcombe writes that he remembers two regular invasions of this species after severe cold, the bays, estuaries, and creeks of South Devon and Cornwall being full of these birds. This happened in each case just before spring, when all were in winter or immature plumage; but some remained until they had assumed the lead-coloured neck and red throat of the nuptial dress, in which they are comparatively rare in the south. This Diver is generally distributed along the south coast, and it is common about the estuary of the Thames, both on the Kentish and Essex sides, where birds which follow the numerous shoals of sprats are in consequence called Sprat Loons,* and being frequently caught in the nets, they are commonly exposed for sale in the London markets throughout the winter. On the broads of Norfolk many are seen, but very few are procured, the boat-shooters leaving them unmolested, as the diving powers of the bird only cause loss of time and labour. In May, on the way northwards, and again in September, red-throated examples are occasionally obtained on both sides of our island; and it is not uncommon to find birds on inland waters, and far up rivers. In Scotland it is abundant, especially on the western side, at all seasons of the year, breeding in Sutherlandshire, and in a few other counties, as far south as the Island of Arran; and also in the Hebrides, Orkneys, and Shetlands. In the North it is almost universally known as the 'Rain-goose,' and its wailing cry is believed to foretell the wet and stormy weather of which it is certainly a frequent accompaniment. At such times the bird generally flies high, and in irregular circles. To the coasts of Ireland this Diver is a regular visitant from autumn to spring, and it appears possible that a few pairs breed on some of the numerous lakes of the remote districts of Donegal.

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* Syst. Nat. Ed. 12, i. p. 220 (1766).

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* The term Loon, or Loom, appears to be a modification of the Scandinavian 'Lom' (Icelandic 'Lómr'), which is probably connected with lame, in reference to the bird's hobbling mode of progressing on land. In Norway the name refers more particularly to the Black-throated Diver; but Nilsson, in his Fauna of Scandinavia, calls all the three species by the name of Lom, distinguishing the Red-throated Diver, on account of its comparatively smaller size, by the name of Sma Lom.

The Red-throated Diver breeds in the Færoes, Iceland, and Spitsbergen, and to the north of the latter Parry found it as far as he went on his boat-voyage. It is abundant in Norway and Sweden, especially to the north of the Arctic circle, occurring in summer, according to Mr. Collett, on almost every holm and islet where a sheet of water is to be found, though but a few square yards in extent. It is numerous in the northern parts of Russia ; breeds on Novaya Zemlya ; and is generally distributed throughout Arctic Siberia to the Pacific ; ranging southwards in winter to Japan, China, and Formosa. It is found across Arctic and sub-Arctic America, migrating as far south as Maryland in winter. In Europe its migrations extend to the Mediterranean, the Black Sea, and the Caspian ; and it is occasionally observed on inland waters, but less frequently than its congeners. Von Heuglin says that he has seen immature birds on the lagoons of Lower Egypt.

On the subject of migration Mr. Gätke, of Heligoland, writes under date of the 22nd of December, 1879 :—"*Colymbus septentrionalis*, almost by the million ; during the last forty years there have never, during a single autumn, been a fiftieth part of what we see now every day—all passing along, principally during the forenoon, east of island in an E. by N. direction, which I think they continue till coming to the Holstein coast, then strike off in a northerly course up to the extreme north of Jutland, and from thence cross over to the Dutch coast, perhaps next morning to renew the trip. There are constantly so many that one scarcely can believe them always to be fresh birds" (Migration Report, Zool. 1880, p. 184).

The Red-throated Diver frequents more retired spots than the Black-throated species, and prefers the shores of small tarns or even pools—often at a considerable elevation—to the islands of a larger loch. Sometimes there is a slight nest of loose rushes and dried grass, but more frequently the eggs are laid upon the bare turf, or stones, within a few feet of the water's edge. In Scotland laying commences by the middle of May, but fresh eggs may be found a month later; they are two in number, of a deep greenish-brown or brownish-grey, spotted with umber; average measurements 2·75 by 1·8 in. It is rare for more than a single pair to breed on the shores of the same lake; but Mr. Collett cites a remarkable exception to the rule, for on a small tarn on an island in the Porsanger Fjord, West Finmark, on the 3rd of July, 1872, he discovered along the banks, in the space of half an hour, no less than fifteen nests, each containing two eggs, most of them in an advanced stage of incubation. A male sitting on the eggs of his mate was shot on the 30th of June, from which it appears that the sexes divide their duties. During the breeding-season, while on the wing, they utter frequently a sound like the word *kakera, kakera*, by which name they are called in many parts of Scandinavia.

Its food consists of fish, molluscs, and crustaceans. In its progress under water this species employs its wings as in the act of flying. In diving, both this species and its congeners slightly sink the body, and then, bending the head and neck forward, disappear with a gentle plunge, which scarcely leaves a ripple on the surface of the water. When suddenly disturbed or frightened, a splash is, however, inevitable.

In the adult bird the beak is of a bluish horn-colour; the irides red; the front and top of the head, chin, cheeks, and sides of the neck ash-grey, varied with lighter grey lines and spots; back of the neck almost black, with short longitudinal lines of white; the scapulars, wing-coverts, back and upper tail-coverts nearly black, speckled with white; quill-primaries black, without spots or streaks; on the throat the red colour forms a conical patch, the point of which is directed upwards, the base resting on the breast, which is white; all the under surface of the body white; flanks spotted greyish-black; legs, toes, and their membranes dark brown on one surface, pale wood-brown on the other.

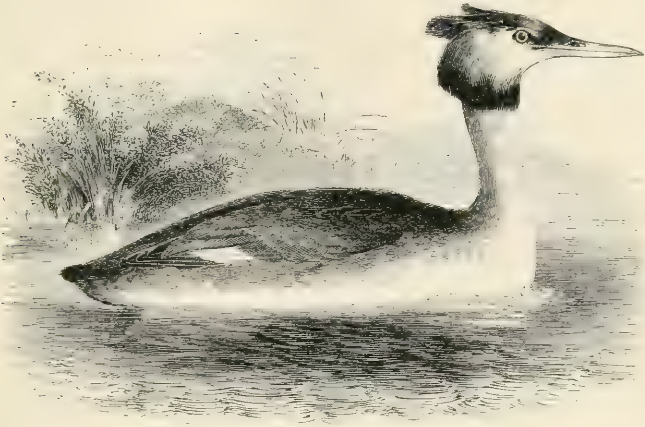
Male birds measure twenty-four inches in length, and sometimes rather more; from the carpal joint to the end of the longest quill-feather eleven inches and a half. Females are usually smaller, some measuring only twenty-one inches in length, and but ten inches and a quarter from the wrist to the end of the quill-feather.

The nestling is covered with a thick brownish-black velvety down, lighter in colour on the underparts. The young bird in first plumage, from which the upper figure in our illustration was taken, has the crown and hind neck dark ashy-grey, narrowly streaked with white; the feathers of the back, scapulars, and wing-coverts margined with white. The white border is first interrupted at the extreme end of the feather, leaving the white marks as two long lateral lines. These lines of white diminish in length by degrees, leaving only one white spot on each outer edge of the feather. At each successive autumnal moult the new feathers are much spotted and margined with white; and this white seems to wear away, leaving the upper parts nearly unspotted. In early summer this is very marked; by July there is hardly a spot on mantle and wings.

In the winter plumage the adults lose the red throat, but it would appear that in mature and vigorous individuals this colour is absent for a short period; thus giving rise to the opinion that birds which had once acquired the dark-coloured throat did not lose it at any season.

Mr. A. H. Cocks states (Zool. 1883, p. 176) that he has seen, in a local collection at Dover, a small specimen of this Diver with the anterior portion of both tarsi feathered throughout their whole length.

Albinos are occasionally met with; a remarkable example which was shot at the Nore is now in the collection of Mr. John Marshall, of Belmont, Taunton.



Podiceps cristatus (Linnæus[*]).

THE GREAT CRESTED GREBE.

Podiceps cristatus.

Podiceps, *Latham*[†].—Bill of moderate length, straight, hard, slightly compressed, pointed, forming an elongated cone. Nostrils lateral, concave, oblong, open in front, and perforate, closed behind by a membrane. Legs and feet long, attached behind the centre of gravity; tarsi very much compressed; three toes in front, one behind; anterior toes very much flattened, united at the base, surrounded by a lobated membrane; hind toe also flattened, articulated on the inner surface of the tarsus; claws large, flat. No true tail. Wings short, first three primaries nearly equal in length, and the longest in the wing.

The Grebes and Dabchicks are diving birds which frequent fresh water during a considerable portion of the year. Their wings are short and small, the thighs and legs being placed so far behind the centre of gravity, and so closely attached to the posterior part of their body, that they sit upright on the whole length of the tarsus, and their walk is constrained. When the birds are on land they are generally close to the edge of the water, into which, if disturbed, they pass with little or no noise to attract observation. They are mostly seen on the water; the form of the whole bird being that of an elongated cone, is admirably adapted for diving; and their habits can only be observed by those who live in the vicinity of their favourite haunts.

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[*] *Colymbus cristatus*, Linnæus, Syst. Nat. Ed. 12, i. p. 222 (1766).

[†] Gen. Synops. Suppl. p. 294 (1787).

The Great Crested Grebe, the largest of the genus, is resident all the year in several parts of this country, which afford extensive surfaces of water, partly overgrown with reeds and other luxuriant aquatic vegetation, in which they find the required security. Some pairs breed, and remain all the year, or by far the greater part of it, on some of the lakes of Wales, such as Llangorse, in Breconshire; on the meres of Shropshire and Cheshire; on the broads of Norfolk; and, previous to drainage, in the fens of Lincolnshire, where in Pennant's time the birds went by the name of 'Gaunts.' In Yorkshire about half a dozen pairs breed regularly at Hornsea Mere. Northwards it becomes rarer, and if seen, it is generally on the coast, when severe weather has frozen the inland sheets of fresh water. Under such circumstances birds in summer plumage are sometimes obtained, but immature examples are far more numerous. These remarks equally apply to Scotland, where as yet it has not been found breeding; and on the west coast it is decidedly rare at all seasons. As a straggler it has occurred in Shetland.

In Ireland this species is occasionally obtained in winter on the coast and on the fresh-water lakes; and in summer it breeds on several of the latter. The Rev. G. Robinson has found many nests of this bird on the borders of Lough Neagh, where the name 'Molrooken' is applied to the bird; and Major E. A. Butler has furnished the Editor with the following interesting extracts from his notes referring to Portmore Lough, adjoining the former:—

"16th May, 1883. A nest containing two fresh eggs, and two more nests with much incubated eggs.

"18th May. Same lough, a nest with three fresh eggs. The nests, which are mere pads of wet sedge floating on the surface of the water, were placed a few yards inside a bed of short bulrushes growing round the edge of the lough, and as the boat we were in approached, the old birds were observed diving away from the spot, which led us to search for the eggs. In every instance there was a second nest within a few yards of the one with eggs, apparently used as a resting-place, or look-out station, by the cock-bird. The eggs we took, although quite fresh, were as usual very dirty and stained, but after being washed they became quite white and good specimens, with a chalky surface much resembling a cormorant's egg.

"29th May. Found that both of the above-mentioned pair of birds had laid again in the old nests, one and two eggs respectively, and I found two new nests containing two and four eggs, all of which were quite fresh. In most instances the eggs were carefully covered over with weeds, and three of the nests were within ten yards of each other, each having as usual a second nest, or pad of sedge, close by, for the male to rest upon.

"8th June. Found eighteen more fresh eggs, doubtless laid for the most part by the birds whose nests I robbed on the 29th May. No nests contained more than four eggs, and, as previously mentioned, several nests were found together—*i.e.*, in the same strip of rush, within a few yards of each other. One nest contained two much incubated eggs, and one quite fresh.

"The note may be described as a harsh monosyllabic croak, but I only heard it uttered when the birds were in the rushes near the nests, probably by the male from his look-out station. They fly well, and I saw them often on the wing flying about the lough at a considerable height, like wild ducks."

The Author was favoured by the Rev. Richard Lubbock with notes on the habits of the Great Crested Grebe as observed on the broads of Norfolk, where it is called a Loon, and is liable to persecution for the beauty of its plumage, and because it is considered to be injurious to fish. A pair or two are to be found on most of the extensive pools during spring, summer, and autumn; but they move over towards the arms of the sea as winter approaches, not remaining to be frozen out, and return early in spring. The nest is frequently built in an exposed situation, before the young reeds have sprouted sufficiently to conceal it, and if plundered the bird immediately makes another in the vicinity and lays again. The birds are more prone to take flight in spring than at other seasons of the year, but as soon as the eggs are deposited, both male and female seem to trust entirely to their powers of diving for preservation, and very seldom show themselves. They generally dive away from their nest on being disturbed, and thus frequently escape observation; a slight vibration among the reeds being the only sign of their departure. The nest is composed of half-rotten decaying water-plants, nearly level with the surface of the water, and is generally very wet. The eggs are usually four in number, originally white, but often becoming ochreous-brown from mud and decomposing vegetable matter; average measurements 2·2 by 1·5 in. The parent birds are very careful of their young, taking them down with them for security under their wings when they dive. They feed them with young eels, and other small fish, some small crustacea, and a portion of vegetable food; tadpoles and small frogs are also a favourite diet with them.

A fine adult specimen belonging to the Ornithological Society lived in St. James's Park more than twelve months. This bird carried a good crest, which did not alter throughout the winter, and in May it was of large size and fine in colour. Unfortunately the Society possessed but a single example of the species, apparently a male. This bird did not associate with any of the other numerous water-fowl; he swam low in the water, and generally kept out in the middle of the widest part, frequently diving for food, occasionally preening his plumage, and sometimes slept in mid-day, the head turned half round, with the beak inserted and hidden among the feathers on the back.

In all examples of the Great Crested Grebe which the Author examined, the stomachs contained a portion of feathers which appeared to have been taken from the white under surface of their own bodies; and the same thing has been noticed and recorded by others. This habit of swallowing feathers appears to be peculiar to the Grebes, but from fish bones being occasionally found mixed up with the feathers, there is cause to suspect these birds bring up at will, from the stomach, the more indigestible parts of their last meal, as hawks, owls, shrikes and some other birds are known to do. Some remarks upon this subject will be found in Thompson's 'Birds of Ireland,' vol. iii. pp. 179–183.

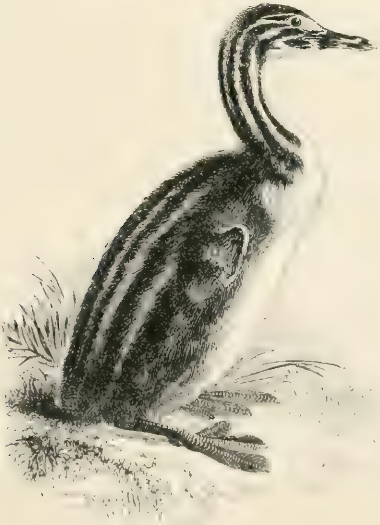
The Great Crested Grebe is only a straggler to the Færoes, and a rare visitor to Norway; but it breeds in Southern Sweden, Denmark, and on both sides of the Baltic; becoming exceedingly abundant in some parts of Russia and Poland. It frequents suitable localities throughout the rest of Europe, breeding as far south as Spain; also in North Africa, Palestine, and Northern India. Its range extends across Central Asia to China, and Japan; it is resident and abundant in South Africa; and a closely-allied, if distinguishable, form inhabits Australia, Tasmania, and New Zealand. It has not, however, been found in North America, where the birds recorded under the name of *P. cristatus*, from the time of Audubon down to that of Coues and Merriam, have hitherto proved to be examples of *P. griseigena*, or some other species.

The under surface of the body of this bird being of a delicate silvery whiteness, and of a shining silky appearance, one of the names of this well-known bird is that of Satin Grebe; and skins, from the beauty of their appearance, are in great request for making muffs for ladies, or as trimming. On the Lake of Geneva, which is frequented in autumn by these birds, it is usual for sportsmen to make parties on the lake to obtain specimens by shooting. The bird is there called *Grèbe de Leman*, and this sport, called *la chasse du Grèbe*, is referred to by M. Necker, in his paper on the Birds of Geneva, and has been described to the Author by an English gentleman who had pursued the amusement. A party of four shooters hire a boat with able rowers, and on a calm day, when the surface of the lake is smooth, they put off, and look out with telescopes for a large Grebe, towards which the men row; on their approach the bird dives, and the boatmen pull with vigour in the direction the bird has taken, in order to be near it when it comes up to the surface to breathe. One of the shooters stations himself in the bow of the boat, one at the stern, and the others are one at each side, about the middle. At the commencement of the pursuit, when the bird is strong, it frequently comes to the surface of the water, out of shot, and has perhaps altered its course, but a good look-out being kept by the shooters at their different posts, the bird is soon descried, and the rowers again urge the boat in chase; the bird dives again, and is again pursued, and on rising is perhaps shot at, but at too great a distance to be effectual, and the bird dives again. In this way the bird, partly exhausted by the necessity of maintaining its exertion, and perhaps slightly wounded, is unable to remain so long under water, but the boat is close at hand, the exertion must be continued, and the Grebe still rises and dives again with so much rapidity that several unsuccessful shots are frequently made. The rowers from practice can tell very nearly whenever the bird dives how many strokes of the oars will bring the boat near the place where it may be expected to rise, and by giving out this notice and counting aloud, the interest is kept up throughout the pursuit, till a fortunate shot gives the fatal blow, when the prize is handed into the boat, and the telescopes are again put into requisition to find out a new victim.

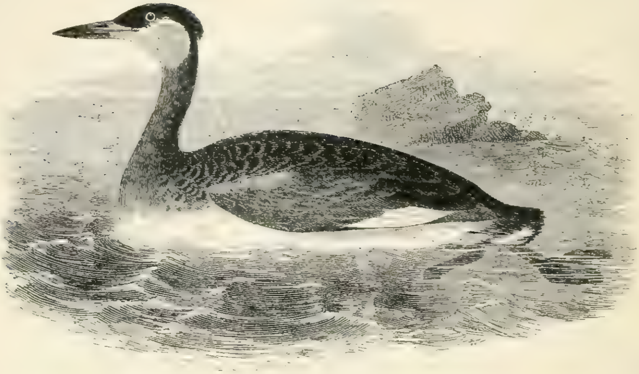
The adult male bird has the bill reddish horn-colour; the irides red; the top of the head, and the elongated feathers of that portion of the crest on the crown of the head, rich dark brown; the cheeks white; the long feathers forming together the tippet, and part of the crest standing out from the sides of the neck are reddish-chestnut at the base, becoming dark chestnut at the end; the neck behind, as also the back, wings, rump, and the short tuft-like tail, dark brown; the secondaries white, but this colour is little seen unless the wings are extended; front of neck, and all the under surface of the body delicate and shining silky white, from which, as before mentioned, this species is sometimes called the Satin Grebe; sides beneath the wing and the flanks pale chestnut-brown; legs and toes dark green on the outer flat surface, lighter pale yellowish-green on the inner surface. The whole length is from twenty-one to twenty-two inches. From the carpal joint to the end of the longest feathers eight inches. The crest is borne constantly throughout the year.

Females are not quite so large in size; the crest is also a little smaller, and the general colours of the plumage less pure.

Young birds in their first winter, and during part of their second year, have but small crests, and little or no reddish-chestnut colour. For some time after they are hatched the young chicks have their bills mottled black and white: the head and neck ornamented with long dark stripes on a ground-colour of dull greyish-white; the upper surface of the body dark brown, with longitudinal stripes of light brown; the whole under surface white. A young bird of this species is figured below.



PYGOPODES. *PODICIPEDIDÆ.*



Podiceps griseigena (Boddaert*).

THE RED-NECKED GREBE.

Podiceps rubricollis.

The Red-necked Grebe is not found in this country so frequently as the Grebe last described; and it is mostly a winter visitor, young birds of the year being of much more frequent occurrence than the adults. It is intermediate in size between the Great Crested Grebe, and the Horned or Sclavonian Grebe, and differs from the other species found in this country in having a much longer and stronger bill in proportion to the bulk of the bird, and the base of the bill is mostly yellow; it is also considered to be more marine in its habits. Like the other Grebes it is an expert diver, and very difficult to obtain when at sea, or in other extensive waters where there is ample space for the exercise of its powers. Its occurrence on our shores is irregular, and, as a rule, in severe winters; but Mr. Cordeaux informs the Editor that since he wrote his 'Birds of the Humber District,' he has found this species more common there in the autumn and winter than the Great Crested Grebe. In February, 1865, Mr. Stevenson examined or heard of no less than thirty-five examples, most of which were killed on the east coast. Mr. Hancock says that it generally appears in Northumberland and Durham in severe weather; he has, however, one in summer plumage which was taken alive on Cullercoat sands; and Mr. C. M. Adamson shot one at Holy Island in mature plumage, with a few red feathers on the neck and breast, on the 8th of October, 1851. This latter bird had its gizzard full of feathers, and a quantity of whole shrimps in its gullet. Examples have been obtained at irregular intervals in Essex, Kent, Sussex, Hampshire, Dorsetshire, and Devonshire; but in Cornwall, according to Mr. Rodd, it is not uncommon in winter, and specimens in nearly adult plumage are sometimes obtained in spring.

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* *Colymbus griseyena*, Boddaert, Table des Pl. Enl. p. 55 (1783).

Along the east coast of Scotland Mr. R. Gray says that the Red-necked Grebe is tolerably frequent, but less so on the west coast; leaving in April and returning in autumn. In the Orkneys it is not uncommon, but in Shetland it appears to be rare. In Ireland it is stated by Thompson to be the rarest of the Grebes, and he only mentions four examples, killed at different times, in the counties of Down, Antrim, Dublin, Wexford, and Cork.

The Red-necked Grebe has never been known to nest in this country, but it breeds abundantly on some of the waters of Denmark, Holstein, and Northern Germany; and although rare in the northern districts of Norway, it is resident in the southern portions of that country. The Author was favoured by the late Mr. Dann with the following notes from his observations of its habits in Sweden :—" The Red-necked Grebe is common during the breeding-season on many of the shallow reedy lakes at the head of the Bothnian Gulf, particularly between Pitea and Lulea. They seem to be confined to the vicinity of the coast of the Baltic. I have never met with them anywhere in the interior of the country, except in Scona, and in the southern provinces of Sweden, although the whole of Northern Scandinavia abounds with lakes. The character of those lakes, where alone I have seen and procured specimens of the Red-necked Grebe, so far north as latitude 66°, is precisely similar to that of the broads in Norfolk and the meres of Holland, where some of the Grebes are so numerous. These Grebes are by no means shy, and when undisturbed amongst the reeds and grass, keep up an incessant croaking. They do not, like many of the divers, use their wings, under water, but glide through it, however, with equal swiftness, and dart through thick entangled masses of weeds and grass with the ease and rapidity of a fish. From the very weedy nature of the waters they invariably frequent, using their wings in diving would impede their progress. I have had repeated opportunities of observing them when under water."

The Red-necked Grebe nests in many parts of Russia and Poland; also, sparingly, in Bohemia; and it occurs on migration over the greater part of Europe, and in the Mediterranean. It is a rare visitant to Asia Minor, Egypt, and north-eastern Africa; but it would appear that some pairs breed in Morocco. Across Northern Asia, in Japan, and throughout North America, there occurs a form which was first remarked in Greenland, and was distinguished by Reinhardt by the name of *Podiceps holbœlli.* This form is characterized by a uniformly greater size, a bill disproportionately larger, stouter, differently shaped and coloured; and a tarsus longer, both absolutely and relatively to the length of the toes. According to Severtzoff these two forms meet in Turkestan.

The nest is placed among aquatic herbage and reeds, being built of similar decayed materials; and the eggs are of a dull white colour tinged with green, averaging 2 by 1·3 in. The call-note is a loud clear *keck, keck, keck.* It feeds on small fish, crustaceans, and aquatic insects. The stomach of one examined by Montagu was found to be distended with its own feathers and small seeds.

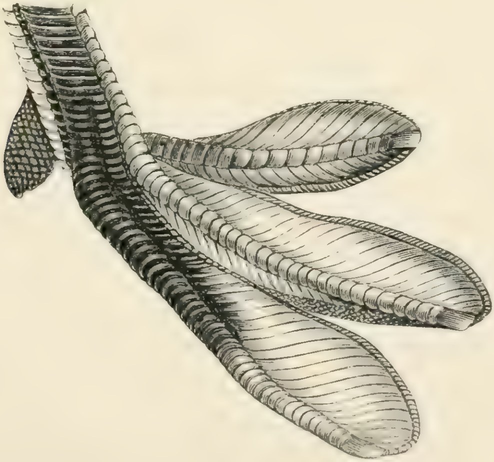
The adult bird has both mandibles of the beak black, except at the base, where they are yellow; the irides red; top of the head, and back of the neck, rich dark brown, almost black; cheeks, chin, and throat fine bluish-grey, margined with white, which forms a sub-ocular streak; back, wing-coverts, tertials, and rump dark brown; wing-primaries nearly black; the secondaries mostly white, forming a conspicuous patch; neck in front rich chestnut-red; breast and belly silky-white, flecked with brown; sides under the wing, flanks, and under tail-coverts greyish-brown; legs and toes dark greenish-brown on the outer surface, the inner surface greenish-yellow.

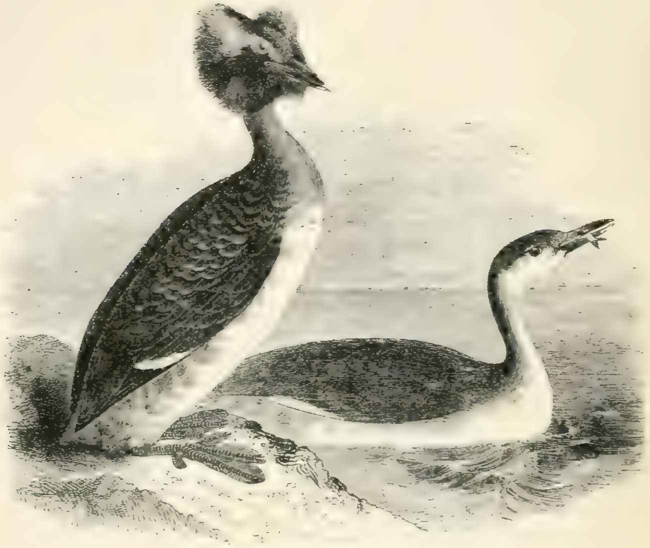
The whole length is sixteen inches and a half. From the carpal joint to the end of the primaries seven inches.

Young birds have the head and neck behind dusky-brown; the back and wings neither so dark in the brown colour, nor so uniform in the tint, as in the adult birds, the margins of the feathers being ash-brown; chin, throat, and neck in front greyish-white; other parts as in the more adult birds. The Author has seen young birds more than half grown which exhibited longitudinal dark stripes on a light ground-colour down the neck.

Mr. John Marshall of Taunton has an albino taken near Beachy Head in 1879.

The figure below represents the form of the foot in the Grebes.





PODICEPS AURITUS (Linnæus*).

THE SCLAVONIAN GREBE.

Podiceps cornutus.

THE SCLAVONIAN GREBE was first described as a visitor to Britain by Montagu, from an example obtained at Truro, in May, 1796. It is a northern species which is decidedly rare on our south and south-west coasts, but it annually visits our eastern waters from autumn to spring; being, according to Mr. Cordeaux, the commonest of the Grebes at the mouth of the Humber. Mr. Stevenson states that, from his notes, which extend over thirty years, the Sclavonian Grebe has been obtained on the Norfolk coast in about the following proportion—October one, November five, December one,

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[*] *Colymbus auritus*, Linnæus, Syst. Nat. Ed. 12, i. p. 222 (1766). It is unfortunate that the specific name undoubtedly conferred upon this bird by Linnæus should have been diverted to its smaller and more southern congener, the Eared Grebe, *P. nigricollis*.

January nine, February twelve, March four, and a pair in full nuptial dress were killed on Sutton Broad on the 16th of April, 1862. The finest specimen the Author ever saw was purchased when fresh killed by his friend Mr. John Morgan, in May, 1826, of a dealer from Yarmouth, who obtained it from one of those boatmen that fish and shoot on the broads in that neighbourhood, and having been preserved by Mr. Leadbeater, was given to him by Mr. Morgan in July, 1827.

On the coasts of Northumberland and Durham Mr. Hancock says that it is not uncommon in winter, and he has one in full summer plumage shot off Cullercoats on the 26th April, 1830; Mr. C. M. Adamson also has a similar specimen shot on the 30th of April, 1860. Northwards it becomes more frequent, and Mr. R. Gray says that in spring it is a very conspicuous species on the western sea-lochs of Scotland up to the last week of April, and a pair was shot on the Loch of Killisport, Argyllshire, on the 20th of June, 1860, and exhibited by Dr. J. A. Smith at a meeting of the Royal Physical Society of Edinburgh. It occurs in the Hebrides and the Orkneys; and Saxby says that in the Shetlands it is the commonest of the Grebes, arriving in October, leaving after a few days, and reappearing about April, when it remains for some weeks; the birds seen in May being nearly always in pairs.

To Ireland, according to Thompson, it is merely an occasional winter visitant, and Mr. R. Warren informs the Editor that on the west coast he has only obtained one out of a pair on the 25th of October, 1878, and one on the 22nd of February, 1879.

The Sclavonian Grebe breeds in the northern portions of Norway, Sweden, and Russia; and some couples nest in Denmark, where, according to Mr. Benzon, it has increased in numbers of late years. The correctness of Mr. Benzon's identification cannot be doubted, but it is remarkable that in Thy, in Jutland, this northern species should be found breeding over the same area as the next and southern species, *P. nigricollis*, which on the other hand seems to reach the extreme northern limit of its range in that portion of Denmark. In the rest of Europe it occurs as a migrant, becoming rare in the south, and in the Mediterranean. In winter it has been found on the elevated lakes of Persia; and Severtzoff says that it breeds in Turkestan. Its range extends across Siberia to Japan; and Swinhoe obtained an example at Amoy in China. It breeds in British North America, where Richardson says it is very common in the Fur countries, frequenting every lake with grassy borders, and in the northern portions of the United States; and in winter it is generally distributed further south; stragglers—one of which is now in Canon Tristram's collection—having been known to visit the Bermudas (Zool. 1877, p. 492). A few young birds are said by Reinhardt to have been obtained in the southern part of Greenland. In Iceland, according to Professor Newton, it is very generally distributed on lakes throughout the western half, and probably throughout the whole of the island; arriving about the same time as the Red-throated Diver, and, after breeding, leaving in the autumn.

The late Mr. Proctor, subcurator of the Durham University Museum, who visited Iceland in the summer of 1837, observed that "this bird frequents the fresh waters there, and breeds amidst the reeds and other rank herbage. The nest is large, and floats on the surface of the water, with which it rises, and falls. It is composed of a mass of reeds and other aquatic plants. The eggs vary in number from two to four, and are, when just laid, of a bluish-white; but they soon become stained by the materials of which the nest is composed. The size of the egg is one inch and three-quarters long, by one inch and one-quarter in breadth. The young birds, when first hatched, are covered with grey-coloured down. No sooner does the old bird perceive danger from any intruder, than she instantly dives, and emerges at thirty or forty yards' distance. One day during my sojourn in Iceland, having observed one of these birds dive from its nest, I placed myself with my gun at my shoulder, waiting its re-appearance. As soon as it emerged I fired and killed it, and was surprised to see two young ones, which it seems had been concealed beneath the wings of the parent bird, drop upon the water. I afterwards shot several other birds of this species, all of which dived with their young under their wings. The young were placed with their heads towards the tail, and their bills resting on the back of the parent bird."

Mr. Morgan's bird, killed in May, in the plumage of the breeding-season, has the beak black, both mandibles of horn-coloured white at the tip; forehead and crown black; irides vermilion-red, with a very narrow white ring; from the base of the upper mandible to the eye, and from thence for the space of an inch behind the eye, the feathers are of a rich yellowish-chestnut, the latter elongated, forming a tuft; from the chin the feathers on the throat, cheeks, and sides of the neck, are also elongated, forming a ruff of rich dark brown; back of the neck, and all the upper surface of the body dark brown; the secondaries of the wings alone are white, but scarcely seen unless the wings are extended; neck in front rich reddish-chestnut, becoming rather darker towards the bottom; breast and belly shining silvery-white; sides under the wings, and the flanks dusky, mixed with some chestnut streaks; legs and toes dark greenish brown outside, varied with yellowish-green on the edges and inner surface. The whole length of the bird is rather more than thirteen inches. From the carpal joint to the end of the wing five inches and a half.

In winter the beak and irides as described in summer; the upper part of the head dark brown; the lower part with the chin pure white, a line from the gape to the eye, and from thence along the lower edge of the ear-coverts, being the line of division between the two colours; back of neck and upper surface of the body dark brown; lower part of the neck in front greyish-white; under surface of body and legs as in summer.

The figure of the male in summer plumage in the illustration at the head of this subject was taken from Mr. Morgan's bird, and the Author's note made on an examination of the internal parts of this specimen, as mentioned by the Rev. L. Jenyns in his Manual of the British Vertebrate Animals, page 253, was, "stomach membrano-muscular, cæcal appendages each one inch and a half in length." The other figure, in the state, as to plumage, in which it has been called the Dusky Grebe, was taken from a specimen obtained in the London market in March, 1825, and which afterwards formed part of the Author's collection. His note of the internal appearance of this bird was, "stomach muscular, a true gizzard, contained insects,* two long cæcal appendages, from four to five inches each." From the difference in the substance of the parietes of the stomach in these two specimens, and particularly in the comparative length of the cæcal appendages, the Author was at first induced to suppose that Montagu and the Editor of the last edition of Pennant's British Zoology were correct in considering the Sclavonian Grebe distinct from the Dusky Grebe; but he was subsequently inclined to believe that though the specimen killed in summer plumage was adult, the other was still a more mature bird. He found the cæcal appendages in *Podiceps cristatus*, killed in its first winter, when six months old, only half an inch long; but in an old bird these appendages measured two inches in length.

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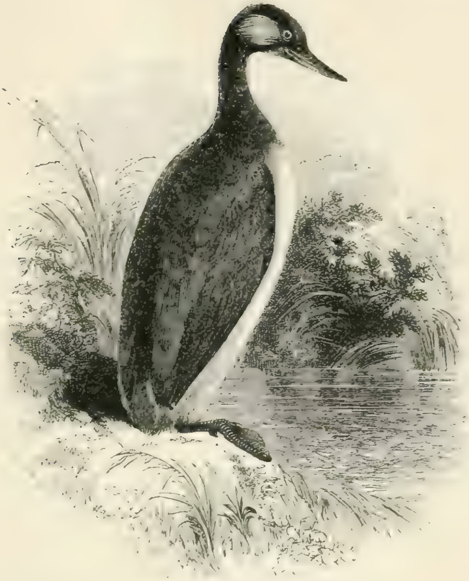
* Dr. Fleming, in his History of British Animals, page 132, says, "In the stomach of a young male, shot 18th January, 1809, I found a concretion, upwards of half an inch in diameter, consisting of its own belly feathers, closely matted together. Montagu, in his Supplement, states that he has observed the same occurrence in the Red-necked and Crested species. Are these to be considered as analogous to bezoars?"



PODICEPS NIGRICOLLIS, C. L. Brehm.*

THE EARED GREBE.

Podiceps auritus.

THE EARED GREBE is the rarest of the five species of Grebes found in the British Islands; and during the many years that Montagu devoted attention to ornithology he only obtained one specimen. It is a southern species, which is distinguished from the Sclavonian Grebe by being a little smaller in size; in having the bill bent slightly upwards, the curve being most conspicuous in the lower mandible; and in the part between the base of the bill and the eye never carrying any ferruginous feathers at any age or season. The reddish, or golden-yellow feathers, when present, arise behind the eye, covering the orifice of the ears. Examples in immature plumage, and, more rarely, according to Mr. Rodd, in their nuptial dress, have several times been obtained in Cornwall; and Mr. Cecil Smith kept one alive for some time which had been taken in Somersetshire. Another bird in breeding plumage, shot by Lord Clifton in the Portland Roads, Dorsetshire, on the 8th of April, 1876, is in the collection of Lord Lilford; and specimens have been obtained in other localities along our southern coast. The bird figured by Edwards (Nat. Hist. Birds, plate 96, figure 2), was taken in a pond at Hampstead, near London, and was sent alive to Sir Hans Sloane; Mr. Bond gave the Author notice of two that were killed in 1841, on the Kingsbury reservoir; and Mr. Joseph Clarke sent an account of one that was taken alive on Duxford common-field, in Cambridgeshire. Several have been killed in Suffolk: some of them in breeding plumage; and in Norfolk Mr. Stevenson is aware of the occurrence of at least twenty-five specimens in full or nearly full summer dress, as against two obtained in winter. An unusual number, some of them in pairs, were secured in the spring of 1862, and one of the females is said to have contained a considerable number of eggs; there is not, however, any evidence that the Eared Grebe has ever bred in this country. Further north, this species is an accidental visitant to the coasts of Lincolnshire, Yorkshire, Durham, Northumberland, and the eastern side of Scotland up to the Orkneys. On the western side it has been taken in the Outer Hebrides; on Loch Sunart, in breeding plumage, in the spring of 1866; and on the Nith in Dumfriesshire; but according to Mr. R. Gray it must be considered as of uncommon occurrence. Mr. Kermode informs the Editor that he has a specimen shot in the Isle of Man on the 22nd of September, 1879; but it appears to be rare on the west coast of England, and in Wales. In Ireland examples have been taken in Belfast Bay in winter; in Armagh and also near Dublin in the month of June; in Wexford in February; in Cork; and on the Moy, between Mayo and Sligo, in February, 1852.

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* Handb. Naturg. Vög. Deutschlands, p. 963 (1831).

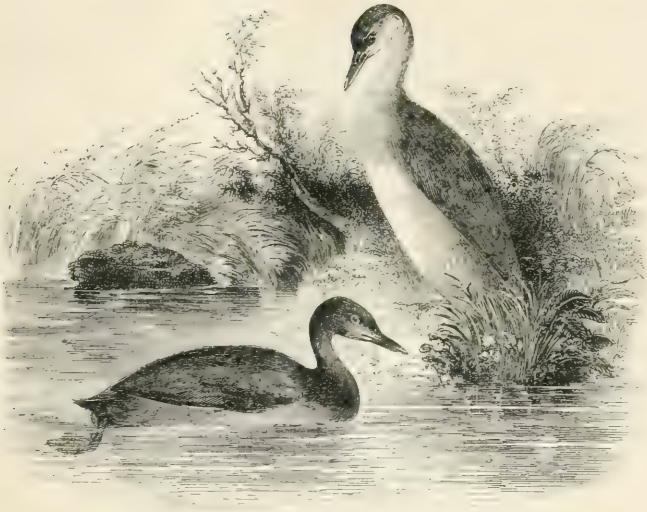
The Eared Grebe is a rare straggler to the southern portions of Norway, Sweden and Finland; but it breeds sparingly in Poland, Northern Germany, and, according to Mr. Benzon, in Thy, north-western Jutland, whence he has obtained several clutches of eggs, and the bird. Southwards this species is found breeding in suitable localities throughout the whole, or greater part of Europe, being especially abundant in some of the marshes on both sides of the Mediterranean, and in Morocco. According to Mr. Layard either this, or a representative form, breeds in South Africa. Our bird has been found in Egypt; also on Lake Ashangi, in Abyssinia; breeds in abundance in the marshes of Palestine; and is found across the continent of Asia to Japan, and China as far south as Amoy in winter, at which season Mr. Hume found it common along the Sind and Mekran coasts. In North America it is replaced by a distinguishable form, *P. californicus*, which has the primaries entirely dark, the first two secondaries being almost the same; whereas in our bird the inner four primaries are white throughout: the rest of the primaries, and the majority of the secondaries, being mostly white.

The Eared Grebe makes its nest on inland lakes and ponds; and Canon Tristram found it breeding on Lake Halloula, in Algeria, in societies more densely crowded than any rookery. The nests are described as raised on artificial islets, frequently almost touching each other, and sometimes piled on stout foundations rising from more than a yard under water. Mr. Benzon states that the nests obtained in Denmark were not floating amongst the rushes, but were on tussocks on the edges of the lake, though in places where the water was deep and clear. The nests were made chiefly of moss, with which the female covered her eggs on leaving them. Incubation appears to take place later with this species than with its congeners; both parents take their turn, and should one be killed the other will continue sitting, and rear the young. The eggs, four or five in number, are originally of a yellowish-white, but frequently become soiled and stained to a dark brown colour; average measurements 1·6 by 1·15 in.

The note of this species is a soft whistling *bib bib,* and during the breeding season like *bide wide wide wide wide* uttered quickly. In the stomachs of some examples recorded by Thompson, were quantities of feathers from different parts of their bodies, large specimens of the doubly-spotted goby, a number of common shrimps (*Crangon vulgaris*), and of opossum shrimps (*Mysis*), and remains of coleopterous insects. The bird usually seeks safety by diving, but it has been known to rise and fly readily. Mr. Gatcombe informs the Editor that he has observed both the Eared and Sclavonian Grebes to dive with a leap when in deep water, as a Shag does; apparently to give an impetus to aid their small and comparatively light bodies in reaching the bottom, or to make head against a current.

The adult male in summer has the beak black; the irides red, with a white circle; head and neck, all round, nearly black; chin speckled with grey; from behind the eye over the ear-coverts a triangular patch of long hair-like golden and reddish-chestnut feathers; back, and all the upper surface of the body, dark brown; secondary wing-feathers mostly white; breast, and under surface of the body, shining silvery-white; sides under the wings, and the flanks, chestnut mixed with dusky lines; legs and feet greenish-grey above, darker behind. The whole length is twelve inches. From the carpal joint to the end of the wing five inches.

Females and young birds in winter so nearly resemble those of the so-called Dusky Grebe, figured and described in the account given of the last species, except in size, and in the form of the beak, as to make another description unnecessary.



PODICEPS FLUVIATILIS (Tunstall*).

THE LITTLE GREBE, OR DABCHICK.

Podiceps minor.

THE LITTLE GREBE, OR DABCHICK, as it is more generally called, is the smallest, as well as the most common, of the British Grebes. It remains here throughout the whole year, inhabiting rush-grown lakes or fish-ponds, and the reedy parts of most rivers during summer, but in winter it is more frequent on small streams. In some of these situations, depending on the season, it may be frequently observed busily engaged on the surface in search of food, or diving to shelter itself for security if disturbed by too close an approach. Though occasionally seen to use its wings when flapping along the top of the water, its powers of flight are said to be limited, and in walking, its progression has been asserted to be still more embarrassed; but Mr. Gatcombe and others have remarked that one kept in the Zoological Society's Gardens could run very swiftly from one place to another, and could stand upright, although in a somewhat knock-kneed position. The bird is, however, very seldom found on land, except close to the edge of the water, into which it returns on the slightest alarm, perfectly conscious that water alone affords it the requisite protection.

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* *Colymbus fluviatilis,* Tunstall, Orn. Brit. p. 3 (1771). The bill being shorter than the head, this species has been placed in the genus *Tachybaptes*: an arrangement sanctioned by a majority of the Committee of the British Ornithologists' Union, but which the Editor deems it inexpedient to adopt in the present work.

Its food consists of small fishes, aquatic insects, with some vegetable substances; and a few of its own soft feathers from the under part of the body are usually found in its stomach. Examples have often been picked up choked by the Bull-head or Miller's Thumb (*Cottus gobio*), which they had vainly tried to swallow. Mr. Selby remarks, "During winter, when the ponds and brooks become frozen, Dabchicks betake themselves to the mouths of rivers and small retired bays, where they feed upon shrimps, fry of fish, and marine insects. At this season I have several times caught them in Budle Bay, on the coast of Northumberland, when they happen to be left in small pools after the recess of the tide. Having first dived, they afterwards invariably endeavoured to conceal themselves among the fronds of the algæ, rarely attempting to escape by flight." Nares, in his Glossary, says that the term Didapper, applied to the Dabchick in some counties, means a little diver.

Like the other species of this genus, the Little Grebe breeds among the reeds and coarse herbage of the waters it inhabits, and, considering the size of the bird, it forms a somewhat large, flat nest of aquatic plants, in which from four to six eggs are usually deposited from April to August, for there can be no doubt that two broods are often reared in the season. The eggs measure about 1·6 by 1 inch, and when first laid they are white, but soon become stained with greenish-yellow and brown, from being in contact with decaying vegetable matter and the soil from the feet of the bird; by hatching-time they are frequently of a dirty clay-brown. The female is very careful of her eggs, and seldom leaves them without covering them over with some of the vegetable substances by which she is surrounded; and the Author agreed with Mr. Selby that the object in thus covering the eggs is concealment, and not for the purpose of preserving temperature during incubation. The young when first hatched are dark brown on the head, neck, and upper surface, streaked longitudinally with yellowish-brown on the neck and back, the forehead and cheeks dark slate-grey, the bill pale rose-colour, the under surface of the body silvery-white. They take to the water very soon, swimming about with the parents in pursuit of aquatic insects and other food; or diving to avoid danger, with all the apparent facility and confidence that usually attend long practice.

The following graphic description is given in a letter addressed by Mr. Chas. Thurnall to Mr. F. Bond, dated Whittlesford, August 27th :—" I saw a rather interesting sight on the river this morning. A Dabchick hatched two eggs this day week and two the next day; well—I was sitting in the boat at the junction of two streams, keeping quite still, when I heard what was evidently the alarm note of some bird sounding like *whit* or *wit*, sometimes repeated twice. Whilst peeping about to see what bird it could be, the dog pricked up his ears and shewed signs of something appearing in the rushes, and immediately two little Dabchicks shewed themselves between the rushes and the boat. On seeing me they dived and came up again amongst the rushes: I pushed the boat gently towards them, wishing to catch one for stuffing, when the alarm was sounded and sundry splashings took place at the stern of the boat; I then saw the old bird about a yard off. On remaining motionless some little time, the young ones swam into the middle of the stream and remained there for a minute, when the same note was sounded and the old one appeared to rise from the bottom of the river close to them. She swam a few feet, the young ones trying to keep up with her; but not succeeding, she stopped, and one went on one side and one on the other, and seemed to take hold of the feathers beneath the wing, which she raised apparently for that purpose, and placing the tip of a wing on each young one, as if to keep them in their places, she swam slowly off, putting one very much in mind of a small river tug-boat towing a couple of barges. I apprehend few people have ever seen such an interesting sight."

The same excellent observer writes as follows:—"I have discovered the manner in which the Dabchick covers up her eggs. I always imagined that it was done with her feet; but I now find that the bird does it with her beak. I dropped my boat down upon one the other day which was just hatching; in fact, one egg was hatched; and I found the young one in the water two yards from the nest. I strongly suspect she pulled it out of the nest in her hurry to get away, for the little thing could only float. Well, I suppose she was so intent upon hatching that she did not observe me until I was close to her, say three yards away. She, on seeing me, immediately stood on the side of the nest, and with her beak pulled the weeds from the side of the nest, taking four or five small mouthfuls, and placed them over the eggs, and immediately dived into the water."

The Little Grebe is common and resident in Ireland, and too universally distributed in localities suited to its habits in England, to render particular enumeration necessary. Its skulking habits tend to screen it from the casual eye, but keen observers have several times detected its presence on such frequented waters as those of the London parks. Mr. Harting says, "We have observed a Little Grebe on the Round Pond in Kensington Gardens, and were not a little surprised one summer to find the bird nesting there; the nest, a floating shallow structure, being moored to some aquatic plants at a distance from the shore." Under the altered condition of this pond, the Dabchick can no longer breed there; but the Editor watched it a few summers ago on the small piece of shrub-surrounded water close to 'the Row' in Hyde Park.

In Scotland this small species is not considered to be so plentiful as with us in the south, but, according to Mr. R. Gray, it is resident and generally distributed throughout the country, including both the Inner and the Outer Hebrides; breeding up to an elevation of 2,000 feet in the western mountains, and even at a greater height in Inverness-shire. It occurs in the Orkneys, and Saxby considers that in the Shetlands, to which it is a winter visitant, it is probably more common than it seems to be, owing to its retiring habits.

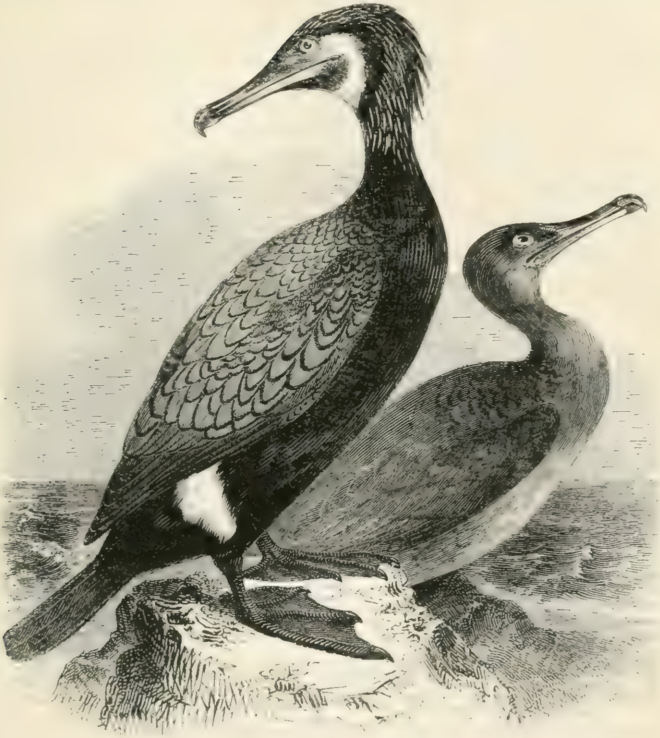
In the Færoes it is of very rare occurrence, and it has not been known to visit Iceland; nor does its range in Norway extend beyond 62° N. lat. It is rare or very local in Finland and in the northern and central portions of Russia; but throughout the greater part of the rest of Europe it is generally distributed in suitable localities, down to the Mediterranean, the Black Sea, and the Caspian. It breeds in North Africa, from Morocco to Egypt; and also in Abyssinia at from 5,000 to 11,000 feet of elevation. In Asia Minor and Palestine it is a resident; it occurs in Persia; and throughout India it is of general distribution in winter, breeding in abundance in Kashgar, Kashmir, and the Northern Provinces, and probably in Ceylon. Subject to slight variations, this species ranges eastwards to Japan and China, and southwards to Burmah, through Malaysia, to Australia, but not to New Zealand; it is also found in Madagascar; and over a large portion of South Africa, where it is resident. It does not occur in America.

The adult bird in summer, represented in the illustration by the one which is swimming, has the beak black, the tip of a light horn-colour, the upper mandible straight, the under mandible brought to a point by a line directed obliquely upwards from the symphysis, or junction of the two portions; the soft part of both mandibles, forming the angle at the gape, greenish-yellow; irides reddish-brown; head, back of the neck, and all the upper surface of the body, very dark brown, almost black; the secondary quill-feathers white, but these are not seen when the wings are closed; chin black; cheeks, sides and front of the upper part of the neck reddish-chestnut; under surface of the body dull greyish-white; sides under the wings and the flanks dusky-brown; legs and toes dark greenish. The whole length nine inches and a half. From the carpal joint to the end of the wing four inches and a quarter. In this state of plumage it is the *Podiceps hebridicus*, or Black-chinned Grebe of authors, which is now known to be only our Little Grebe in summer dress.

Adult birds in winter have the under mandible lighter in colour than the upper; the latter being dark brown; head, back of the neck, and all the upper surface of the body, clove-brown; some of the primary quill-feathers, as well as the secondaries, greyish-white, but only seen when the wing is extended; chin white; front of the neck ash-brown; breast and belly shining greyish-white; sides under the wing and the flanks, ash-brown. Weight 7 ounces.

Young birds of the year, in their first winter, have the beak yellowish-brown; the head and back of a still lighter brown colour than old birds in winter; chin white; sides of the neck pale wood-brown; under surface of the body and the sides clouded with brown on a ground-colour of greyish-white.

An example of the American Pied-billed Grebe (*Podilymbus podiceps*), stated to have been shot near Weymouth in January, 1881, was exhibited by Mr. R. Bowdler Sharpe at a meeting of the Zoological Society (P. Z. S. 1881, p. 734); but there seems to be the possibility of an accidental exchange of specimens having taken place at the bird-stuffer's, and at all events there is no other record of the occurrence of this American species in Europe.



PHALACROCORAX CARBO (Linnæus*).

THE COMMON CORMORANT.

Phalacrocorax carbo.

PHALACROCORAX, *Brisson*†.—Bill moderate, or long, straight, compressed, culmen rounded ; upper mandible very much curved at the point, hooked ; the base connected with a membrane which extends to the throat. Face and throat naked. Nostrils basal, linear, hidden. Legs strong, short, abdominal ; three toes in front, one behind, the hind toe articulated on the inner surface of the tarsus ;

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* *Pelecanus Carbo*, Linnæus, Syst. Nat. Ed. 12, i. p. 216 (1766).

† Ornithologie, vi. p. 511 (1760).

all four toes united together by membranes ; claw of the middle toe serrated on the inner edge. Wings of moderate length, the third quill-feather the longest. Tail-feathers stiff and rigid.

THE GREAT CORMORANT, or Black Cormorant as it is sometimes called, to distinguish it from the Green Cormorant or Shag, next to be described, is found in considerable numbers on most of the rocky parts all round the coast. In the Channel Islands, and, as a rule, along the south coast of England, and in Wales, it is less abundant as a breeding species than the Shag, but on the other hand it is frequently found nesting in inland situations, which the Shag is never known to do. On the eastern side of our island it used formerly to nest on the trees at Reedham, in Norfolk, in the time of Sir Thomas Browne, who states that from there King Charles I. was wont to be supplied ; and, according to the late Rev. Richard Lubbock and Mr. Stevenson, it nested within a comparatively recent period in the trees around the decoy at Fritton, in Suffolk. From its station on the Flamborough cliffs it had been driven by persecution, but Mr. W. E. Clarke says that, owing to the Sea-birds' Preservation Act, a few birds have returned to their former haunts. On the Farne Islands there is a large colony ; and there are numerous breeding-places along the coast of Scotland. In the Shetlands it is less common than the Shag, which also as a rule outnumbers it on the west coast of Scotland and in the Hebrides ; but in Ayrshire and Wigtonshire the Cormorant is in the majority, breeding on the sea-cliffs and also on the inland lochs. In Wales, in addition to many places on the coast, there is a celebrated breeding-haunt in Merionethshire, in the valley which runs up from Towyn to Cader Idris, on a bold crag about 400 feet in height, known as Craig y dern, *i.e.*, the Bird-rock.

In Ireland the Cormorant is of ordinary occurrence, breeding on many parts of the coast and also inland. Thompson states that upon an island in the demesne of the Earl of Shannon, Castle Martyr, County Cork, more than eighty Cormorants' nests were counted in one season, on Scotch fir-trees not under 60 feet in height, in which they hatched their young; and Mr. J. J. Folliott Darling gives an account (Zool. 1882, p. 68) of a colony of seventy or eighty pairs which he found breeding on an island in Lough Attymas, about eleven miles from the sea, on some bushes which had previously been occupied by a colony of Herons until driven off by the Cormorants.

This species is common in the Færoes; and tolerably abundant in Iceland; also in Greenland up to about 70° N. lat. Its distribution extends over the whole of Europe, North Africa, Egypt, the greater part of Asia, and Malaysia. In Australia and New Zealand we find a doubtfully distinct form, *P. novæ-hollandiæ;* and in South Africa our bird appears to be represented by *P. lucidus*, although there are statements that *P. carbo* has occurred there. In North America the Cormorant is found on the Atlantic side from Hudson Bay and Labrador in summer, to New Jersey in winter, but on the Pacific side its presence has not yet been recorded; otherwise this species would be almost cosmopolitan in its range.

In this country, Cormorants, when at their breeding-stations, usually prefer the higher parts of rocks or cliffs, and many birds congregate harmoniously together. They make a large nest, composed of sticks, with a mass of sea-weed and long coarse grass; laying from three to five, and sometimes six eggs, small for the size of the bird, oblong, similar in shape at both ends, rough in texture, of a chalky white colour covering a pale blue; average measurements, 2·75 by 1·6 in. Mr. Booth says that at times their nests are placed on low islands, and are only elevated a few feet above high-water mark. Amongst the sticks and litter which the Cormorants use for building, he has seen children's whips and spades, a gentleman's light cane, and part of a handle of a parasol (Zool. 1877, p. 389). Mention has already been made of the nesting of this species on trees, and on the Continent, and in India such situations are frequently occupied. Mr. S. B. Doig describes one in a swamp in the Eastern Narra district where the nests are all placed on trees only a few feet above the water, and were large platforms of sticks, lined with grass. Mr. H. Seebohm has given an account (Zool. 1880, p. 460) of a colony near the Horster Meere, in Holland, in which some 200 nests were on the open ground.

The young when first excluded are blind, and covered with a bluish-black skin; in the course of a few days they acquire a thick covering of black down, and in three weeks or a month they are sufficiently fledged to be carried on the backs of their parents to the water, though still unable to fly. The old birds fly well, generally low over the surface of the water; they swim rapidly, and dive in perfection; their food is fish, which they appear to catch with great ease and hold with certainty, by the sharp, hooked, horny point of the upper mandible; their dilatable throat enabling them to swallow a large prey.* When fishing they are frequently observed to carry their heads under water, perhaps that vision may not be interfered with by the ripple on the surface. They are frequently seen sitting on posts, rails, or leafless trees by the water side, when, if a fish should move on the surface within their sight, it is pounced upon, and caught to a certainty. An eel is a favourite morsel with him, and a Cormorant has been seen to pick up an eel from the mud, return to the rail he was previously sitting upon, strike the eel three or four hard blows against the rail, toss it up into the air, and catching it by the head in its fall, swallow it in an instant. Cormorants on the wing frequently follow the course of a river many miles inland; and some years ago one of these birds was shot on King's College Chapel, Cambridge.

That Cormorants possess considerable intelligence is shown by several circumstances. They are easily reconciled to confinement; and Montagu, in his Supplement, relates an interesting account of one that very soon became so tame and attached, that it seemed to be never so happy as when permitted to remain by the side of its owner. Saxby, in his 'Birds of Shetland' (p. 317), describes one which used to go and fish for himself, always returning to the fireside, which was his favourite place, and so attached was he to his master that he would fly several hundred yards to meet him.

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* Mr. Gatcombe has known a Wrasse 14 inches in length and over 4 inches in depth, taken from the gullet of a Cormorant shot in Plymouth Sound.

Sir Robert Shafto Adair told the Author that a pair of Cormorants took to, fed, and brought up a nest of young Ravens, the natural parents of which had both been destroyed. The gamekeeper was desired to watch the proceedings, and reported that the Cormorants brought a constant supply of fish.

It would appear that from time immemorial down to the present day, the Chinese and Japanese have trained Cormorants to take fish. The bird is taken to the water side; a metal ring, or leather strap, by way of collar, is usually, but not invariably, put on its neck, and it is then set at liberty to catch a fish, which it brings to hand when called, a small cord being attached to it, while in training, to insure return; having satisfied the wants of the master, the collar is taken off, and the bird is then allowed to fish for itself. On other occasions, when well trained, two birds are taken by the fisherman upon the water on a raft to fish, as shown in the representation used as a vignette at the end of this subject. The Cormorants appear to fish and rest by turns, and are assisted in gaining a footing upon the raft by the fisherman using a short pole. From an interesting history of fishing with Cormorants, given by Mr. J. E. Harting in his 'Essays on Sport and Natural History,' pp. 423-440, it would seem that this practice was introduced into Europe as an amusement early in the seventeenth century: probably by the Dutch; and was taken up by Louis XIII. of France, and James I. of England. The latter became fascinated by the sport, which was also followed by his son and successor. According to Pennant, Whitelocke had a cast of them "manned" like hawks, to come to hand, in which he took much pleasure, relating that the best he had was one presented to him by Mr. Wood, Master of the Cormorants to Charles I. Willughby, in his 'Ornithology' (1678), describes the mode of training and fishing, which, after long desuetude has been revived in this country by the well-known falconer, Capt. F. H. Salvin. In 'The Field' of the 27th of May, 1882, will be found an account of the breeding of two of his trained birds, "Kao-wang," the female, aged 19, and the "Sub-inspector," aged 8, in the Zoological Gardens, at the Regent's Park, in 1882. The birds paired in March, building a rough nest of sticks on a felled tree in the Gull-enclosure, and by the 25th of the month three eggs had been laid, when both birds took turns at incubation. On the 22nd of April two young ones were hatched, and the task of feeding them was undertaken entirely by the male bird. After he had been fed and retained the fish about an hour, he mounted the side of the nest, and as each young bird came out from under the hen, the male opened his great mouth, and in went the nestling as far as the outstretched wings would allow, and helped itself to the now macerated fish in the old one's crop. At this time the young made a great noise, and moved the upper part of their pouches with a rapid fan-like motion, just as the old birds do when too hot from the sun.

The illustration represents two birds killed at the Isle of Wight; the bird in front being in the plumage of the breeding-season; whilst the other is a bird not yet sufficiently matured to assume the breeding-dress. Some observations made upon living Cormorants in the Gardens of the Zoological Society will afford further explanation. Some white feathers on the side of the head and neck began to appear on an old bird on the 4th of January, 1832, and arrived at their perfection by the 26th of February. They remained in this state till the 2nd of April, when they began gradually to disappear, and by the 12th of May were wholly lost, having been fifty-three days arriving at perfection, thirty-six days stationary, and forty days disappearing; making together a period of eighteen weeks three days. These white feathers were new ones, much longer than the black feathers of the same part, rounded in form, and in some degree resembling bristles. Some white feathers began to appear on the thighs of the same bird on the

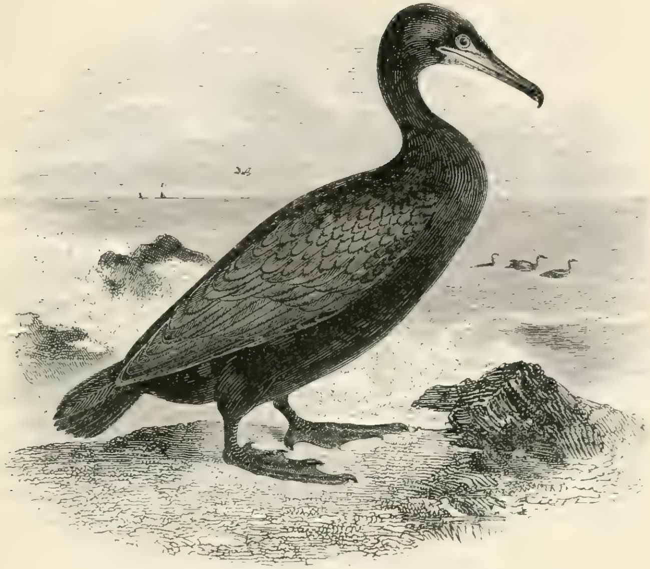
24th of January, and the patch was completed in five weeks. These white feathers began to disappear about the 16th of June, and by the 20th of July were almost entirely gone. In the wild state the white patches, &c., are assumed by the middle of February in this country, and much earlier in the south of Europe. The sexes are alike in plumage, but the female has the longer crest, and is the brighter in colour, as well as the larger in size. A young Cormorant brought to the Gardens in the autumn of 1830, did not go through any change during the summers of 1831 or 1832. The adult plumage is not acquired until nearly the end of the third year.

In an interesting paper in the Journal of the Linnean Society for 1881, Zoology, p. 455, Dr. J. C. Ewart has pointed out that the nasal arrangement in the Cormorant, and to some extent also in the Gannet (*Sula*), differs from that of other birds in several important particulars. There is a very small external nostril, the passage in the slit-like aperture being nearly obliterated in the adult; the osseous canal is scarcely 1½ millimetres in diameter in its narrowest part; and the nasal chamber is in very free communication with the mouth. This is supposed to explain the gaping of the bill often noticed after prolonged flight.

The adult bird during spring, and the early part of summer, has the bill pale brown, the point horny, hooked, and sharp; irides emerald-green; forehead, crown, nape, and part of the neck black, mixed with many white hair-like feathers, the black feathers on the occiput elongated, forming a crest; base of the upper mandible, and the gular pouch yellow, the pouch margined with white; the back and wing-coverts dark brown, each feather margined with black; quill-feathers black; tail, consisting of fourteen feathers—whereas the Green Cormorant has only twelve—black; lower part of the neck all round, with the breast and all the under surface of the body, a rich velvet-like bluish-black, except a patch on the thigh, which is white; the legs, toes, and their connecting membranes black; whole length about three feet; of the wing fourteen inches and a half.

A young bird has the upper mandible dark brown, the lower one pale brown; irides brown during the first year, then pale bluish-green, changing to emerald-green at the end of the second year; forehead, hind neck, back, wings, and tail dark brown; chin, throat, and neck in front dull white, mixed with pale wood-brown; lower part of neck in front darker brown, mottled with white; under surface of body dull white, varied with a little brown; sides and flanks dark brown; legs, toes, and membranes nearly black.

A female with white on three of the tail-feathers is recorded by Mr. T. H. Nelson (Zool. 1880, p. 366); and Saxby states that during the years 1869 and 1870 two pure albinos, with light-coloured feet and bills, were observed about the west coast of Unst.



PHALACROCORAX GRACULUS (Linnæus*).

THE SHAG, OR GREEN CORMORANT.

Phalacrocorax graculus.

THE SHAG, also known as the Scart, or Crested Cormorant, is immediately distinguished from the Common Cormorant, when adult, by its prevailing green colour, as well as its smaller size, and the young birds, which are more alike in colour, may always be recognized by the tail-feathers, which are only twelve in the present species, whereas in the Common Cormorant they are fourteen in number. The matured Cormorant and the Shag both wear crests in spring, but neither of them have a crest in winter, while the immature birds of both these species have no crest at either season.

* *Pelecanus Graculus*, Linnæus, Syst. Nat. Ed. 12, i. p. 217 (1766).

It is also common to find the crested mature birds associating and breeding in one locality, and the non-crested immature birds congregating, but not breeding, in another.

The Shag is essentially a marine species, very seldom wandering even for a short distance inland, or being found on fresh water. Thompson cites two exceptional occurrences where exhausted individuals were captured twenty and thirty miles from the sea. It is more local than the Common Cormorant; its favourite haunts being rugged coasts, honeycombed with caves; or islands, margined with fallen rocks and large boulders, amongst which it often makes its nest. It also selects ledges in the cliffs, like its larger congener; but it shows a distinct partiality for caves; the nests being frequently placed on ledges near the summit, and so far in that the sitting birds can scarcely be discerned amidst the gloom. In such situations, which predominate on the west coast of Scotland and its islands, and along a great extent of Ireland, the Shag is, on the whole, the more abundant of the two species. It is well to remember that by fishermen and sea-side folk the names 'Shag' and 'Cormorant' are frequently interchanged.

The range of the Shag is far more restricted than that of the Common Cormorant, and westward it does not appear to extend beyond Iceland. The species is common in the Færoes, and on the coast of Norway; but it is scarcely known to enter the Baltic, and it appears to be rare on the German shores of the North Sea. It breeds in the Channel Islands and along the north-west and western coasts of France; also on the Atlantic coast of Spain and Portugal, and in north-west Morocco. Throughout the Mediterranean is found a form with generally brighter colours, which has been distinguished by the specific name of *P. desmaresti*, and is said to have no crest at any season of the year; but such is not the Editor's experience, nor does he consider the species a valid one. In South Africa is found a closely allied species, *P. capensis*.

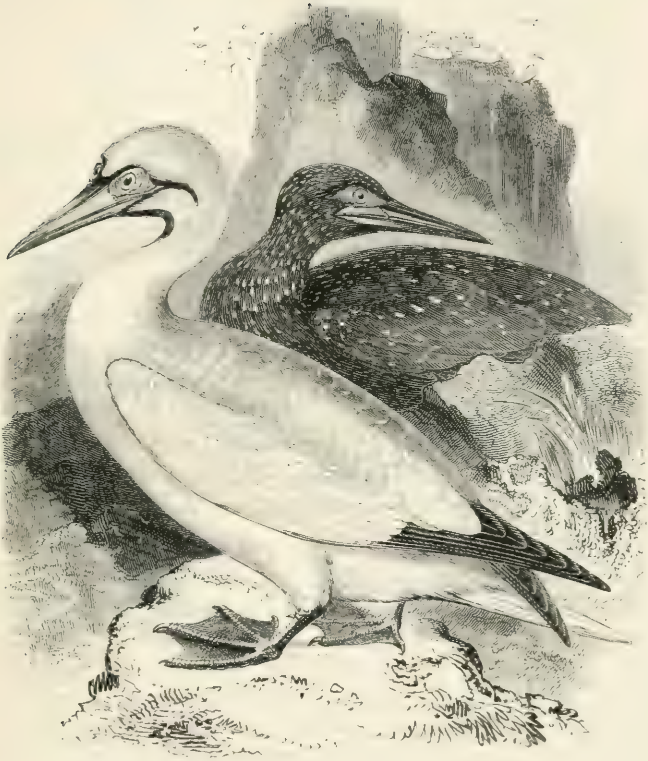
Shags pair early in April, and the nest is formed of seaweeds, twigs, and grass, matted and plastered together, and emitting a horribly fœtid smell. In this country eggs up to five in number are frequently found; but, according to Mr. Dresser, Mr. Collett says that occasionally as many as eight eggs have been found in the same nest in the north of Norway, where the species breeds in large numbers, in company with Eiders, Kittiwakes, and other sea-birds, though seldom with the Cormorants. The eggs, which are laid from May to June, are pale blue encrusted with chalky white, like those of the Cormorant, and are subject to considerable variation in shape, some being roundish, others pointed at one end, whilst some are long and narrow; average measurements 2·4 by 1·4. Mr. Chichester Hart says that in one nest of the Shag he found an egg nearly fresh, a young bird just hatched, and another apparently about a week old. The young nestlings are bare and of a purplish-black colour; afterwards they are covered, excepting the head, part of the neck and the abdomen, with brownish-black down. As observed by Mr. Harting on the Dorsetshire cliffs (Zool. p. 9676), they feed themselves from the crop of the parent, like the Cormorants.

Shags live principally on sea-fish, in pursuit of which they exhibit all the skill of their congener, and have a similar serrated claw, but as neither of them are observed to attempt to catch, or to hold fish with their feet, it would seem that their serrated claw is not used to enable them to retain a slippery prey; while from some remains of down and feather found adhering to the serrations in one of the Bitterns, it would rather appear that the pectinated claw was used to dress and arrange the plumage, and to free the bird from parasites. The Shag has been caught in a crab-pot fixed at twenty fathoms below the surface, which will give an idea of the distance to which it dives. Its mode of diving is by a spring out of the water; and it has been stated that neither this species nor the Common Cormorant use their wings under water, but propel themselves entirely by their feet; this, however, is denied by Macgillivray, who says that in deep water he has frequently seen the Shags rapidly wending their way under the boat, using their out-spread wings; and such is also the Editor's experience of the habits of this bird as observed in the deep clear water of the coast of Donegal. In a tank or pond their movements would naturally be different.

In the adult bird the bill is black, the base of the under mandible chrome-yellow, and the naked skin about the gape black, thickly studded with small round yellow spots; the irides green; the forehead bearing a crest curved forward, assumed very early in the spring; the crown, neck, breast, and all the under surface of the body a rich dark green with purple and bronze reflections; back and wing-coverts dark green, each feather with a narrow, but darker margin; wing and the twelve tail-feathers black; legs, toes, and their membranes black. Total length twenty-seven inches; of the wing from the wrist ten inches and three-quarters. Both sexes are alike in plumage.

Young birds have the bill very slender, the membrane of the lower mandible yellow; the upper plumage brown, tinted with green; the under surface brownish-ash, mingled with white.

Mr. J. Whitaker has a variety, shot in Scotland in the winter of 1883, of a cream colour with light brown markings on the back and wings.



SULA BASSANA (Linnæus[*]).

THE GANNET,

OR SOLAN GOOSE.

Sula alba.

SULA, *Brisson* †.—Bill strong, long, forming an elongated cone, very large at its base, compressed towards the point, which is slightly curved; edges of the mandibles serrated; the angle of the gape behind the line of the eyes. Face and throat naked. Nostrils basal, obliterated. Legs short, strong, placed rather backward; three toes in front, one behind, articulated to the inner surface of the tarsus, all four toes united by membrane; claw of the middle toe pectinated. Wings long, first quill-feather the longest. Tail cuneiform.

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[*] *Pelecanus Bassanus*, Linnæus, Syst. Nat. Ed. 12, i. p. 217 (1766).

[†] Ornithologie, vi. p. 494 (1760).

THE GANNET is a constant resident on our coast, but with considerable change of locality, depending on the season of the year. The only breeding-station in England is on Lundy Island, which would appear from Leland to have been occupied by this species in the time of Edward II., and Drayton alludes to it in his 'Polyolbion,' Song 4. In spite of the protection afforded by the proprietor, few birds succeed in rearing their young there; and more than twenty years ago, a colony, supposed to be an off-shoot from Lundy, established itself on an island off the coast of Pembrokeshire, in Wales, where it still thrives.

In Scotland the breeding-places of this species are more numerous. On the east coast the only one is the well-known Bass Rock; but on the west side there are four, namely: Ailsa Craig; the islet of Borrera, close to St. Kilda; the island of Sula Sgeir, or North Barra, on which from 2,000 to 3,000 birds are sometimes taken in a season; and the Stack of Suleskerry, about forty miles west of Stromness, in Orkney. From Ailsa Craig the birds disperse themselves in the daytime along the neighbouring Scottish coast, and also visit the northern shores of Ireland with great regularity. From the highest point of Rathlin Island, off Antrim, the Editor has watched a continuous stream of birds coming from the Craig in the early morning, and by following it up, the eye was directed to the position of the rock, which is upwards of forty miles distant.

In Ireland Sir R. Payne Gallwey says that from 300 to 400 birds nest on the Little Skellig, off the coast of Kerry; the species also breeds on the Fastnet Rock, off Cape Clear, and numerously on the Bull Rock at the entrance of Bantry Bay. The 'Stags' (*i.e.* Stacks) of Broadhaven, off the coast of Mayo, on which the bird formerly bred, are now abandoned.

In the Færoe Islands the Gannet breeds on Myggenæs, the most western of the group, where the 25th of January is a festival in consequence of the arrival of this bird. In Iceland it has several breeding-places; and thousands nest on the Magdalene Islands, and some other rocks in the Gulf of St. Lawrence. Its winter range extends over the North Atlantic down to North Africa and Madeira on this side, and the Gulf of Mexico on the other; but it seldom enters the Baltic or goes far up the Mediterranean. After stormy weather it has occasionally been taken at a considerable distance inland. In Africa, from Angola southward, the place of our bird is taken by *S. capensis*, which has a nearly black tail; and it is in the Southern Hemisphere that the genus is best represented.

The Gannets at the Bass Rock have been frequently described, but by few so fully as by Mr. E. F. Booth of Brighton, in his 'Rough Notes,' pt. v., with six beautiful coloured illustrations, after drawings by Mr. E. Neale, showing the successive stages of plumage. The Gannets assemble in March, and an egg was once laid by the end of that month, but as a rule incubation does not commence until the early part of May. Owing to interference from sight-seers, the birds have to some extent retired from the more accessible portions, but it does not appear that there is any material falling off in the number on the Rock, although fewer young are annually collected than formerly, when from 1,500 to 2,000 have been taken; now the average is about 800. The beginning of August is the usual time for the "harvest," the young birds being hooked up, killed, and thrown into the sea, where a boat is in waiting to pick up the bodies. These are plucked, cleaned, and half-roasted, after which they are sold at from eightpence to a shilling each; but the Editor was told by the landlord of the inn at Canty Bay, who rents the Bass, that the old race of "goose" eaters was dying out, and there would soon be few left who could relish a "goose" on its merits; the majority buying the birds in ignorance of what they were, and because they yielded a good deal of food for the price. The fat is boiled down into oil, and the feathers, after being well baked, are used for stuffing beds; about 100 birds producing a stone of feathers.

The birds form their nest, which seldom exceeds six or eight inches in height, of a mass of sea-weeds, particularly the *Fucus digitatus*, and grass, upon which they deposit a single egg, which, when first laid, is of a chalky white, tinged with pale blue, but soon becomes soiled; average measurements 3·25 by 1·9 in. During incubation, in consequence of being unmolested, the Gannets become very tame; and, where the nests are easily accessible, will allow themselves to be stroked by the hand without resistance, or any show of impatience, except a low guttural note which sounds like *grog, grog*. Sometimes the old birds are very vociferous, and as they are continually interfering with each other and taking advantage of the absence of their neighbours to pilfer the materials of their nests, a constant noise is kept up amongst them, which may be expressed by the syllables *carra, carra, crac, cra*. Curious materials are sometimes found in the nests of this species; Martin was told at St. Kilda that a red coat had been found in one nest, and a brass dial, an arrow, and some Molucca beans in another.

From an excellent monographical account of this species by Dr. R. O. Cunningham (Ibis, 1866, pp. 1–23), it appears that the earliest reference to it is in the Anglo-Saxon Chronicle, in which, in the account of the events recorded in A.D. 975, Oslac is said to have been driven into exile "over the rolling waves—over the ganet-bath." "Solendæ" are alluded to by John de Fordun in his 'Scotichronicon' as breeding on the Bass Rock; and Hector Boethius gives details of the habits of the "Solands" in his 'Scotorum Historiæ,' published in 1526. The species was subsequently noticed by Turner, Gesner, Clusius, William Harvey, Ray, Willughby and Martin: to say nothing of mere copyists, or of later writers. The name Gannet is doubtless a modification of the ancient British *gans*, which corresponds with the old High German *kans*, the Greek χὴν, the Latin *anser*, and the Sanskrit *hansa*, all of which signify a Goose; but the origin of the name Solan or Soland, in its various forms, is not so obvious. By some of the earlier writers the word was derived from the Latin *solea,* in consequence of the bird's supposed habit of hatching its egg with its foot! In the 2nd and 3rd Editions of the present work, the Author suggested in a foot-note "Solent or Channel Goose" as its meaning; but, as remarked by the editor of 'The Ibis' for 1866, in a foot-note to Dr. Cunningham's paper, it seems at least as probable that the "Solent" took its name from the bird.

Gannets feed exclusively upon fish, and being birds of great powers of flight, they take a very wide range over the sea in search of food. Shoals of herrings, pilchards, or sprats, appear to have the greatest attraction for them, and all the species of the genus *Clupea,* it will be recollected, swim near the surface. On quitting their northern breeding-stations in autumn, many of these birds take a southern direction. Off the Cornish coast, Mr. Couch says in his Fauna, "Adult birds are most abundant in autumn and winter, fishermen learning by the actions of these birds when shoals of pilchards are present, and the direction they are pursuing. The Gannet takes its prey in a different manner from any other of our aquatic birds; for traversing the air in all directions, as soon as it discovers the fish, it rises to such a height as experience shows best calculated to carry it by a downward motion to the required depth; and then partially closing its wings, it falls perpendicularly on the prey, and rarely without success, the time between the plunge and emersion being about fifteen seconds." Mr. Booth, however, found that his young Gannets from the Bass Rock, where pilchards are not known, would not willingly eat that fish, rejecting it when thrown to them with herrings, which, with mackerel, formed their favourite food. In autumn and winter, off the coast of Cornwall, this species feeds largely on sprats and anchovies. Gannets attracted to the same shoal, and fishing in company, are frequently caught in considerable numbers by becoming entangled in the meshes of the fishermen's long sea-nets.

Two Gannets taken from the Bass on the 19th August, 1874, paired and made a nest in a shed in Mr. Booth's garden early in March, 1879. On the 4th May it was found that the female was covering an egg, but some younger Gannets in the same enclosure dragged away some of the materials of the nest and smashed the egg. In 1880 another nest was made, and an egg was noticed on the 19th of May. The young bird, "a small black shapeless monstrosity, resembling a toad," was hatched on the 1st July; and on the 7th it showed the eyes open, the irides dark hazel, the beak a dull slate, white at the point, and a slight sprinkle of down on the head. By the 11th of August it was fully covered with down; tail-feathers began to show on the 18th, and by the 17th of September very little down remained. On the 2nd of October the young bird was fed by its parents for the last time; and Mr. Booth says that he was told by the natives of Canty Bay that the old birds take no notice of the young after they leave the nest.

Occasionally the down remains latest on the head and neck, giving the bird the appearance of wearing a long wig; and an excellent illustration of this quaint stage, in which it is known as a "Parliamentary Goose," is given in Mr. Booth's book. From the experiences of that gentleman, and from the investigations of the Editor at the Bass, the successive plumages may be briefly described as follows:—

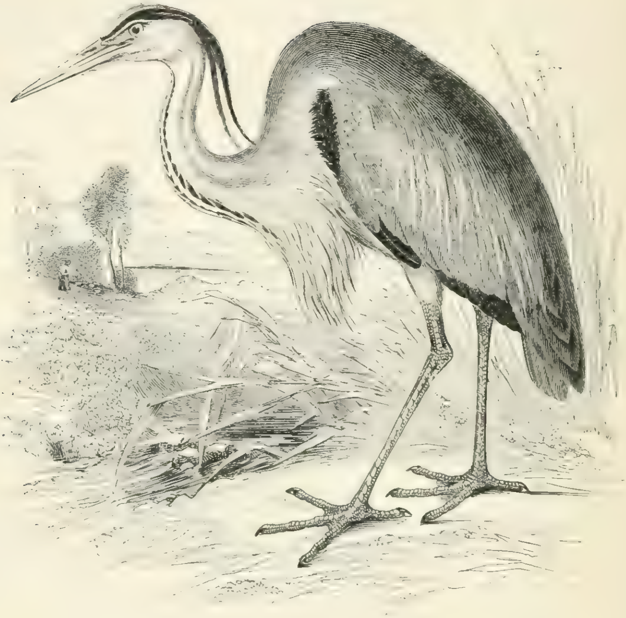
In the bird of the first year the bill is almost black; the general plumage mottled dusky-ash and buff below, and blackish-brown above, flecked with white. In the second year the underparts are principally white, the head and neck being streaked with ash-brown; wings and mantle still dark, with fewer white spots. The third year the head and neck are white with a little tinge of buff, and the mantle is diversified with white, especially on the scapulars and secondaries; tail also shows some white; bill nearly white. During the fourth and fifth years the white gradually increases and pervades the upper parts, and in the sixth year the bird attains full plumage. In the adult bird the bill is of a horny-white; the naked skin of the face bluish-black; irides pale straw-yellow; the head and neck buff-colour, which increases with age; all the rest of the plumage white, except the wing-primaries, which are black; the legs and toes in front green, the other portions and the connecting membranes almost black. The whole length of the bird is about thirty-four inches; from the wrist to the end of the first quill-feather, nineteen inches.

From the account given to Mr. Selby by a resident at the Bass, it would appear that the Gannet is a very long-lived bird, as certain individuals had been recognized, from particular and well-known marks, as invariably returning to the same spot to breed for upwards of forty years.

In Mr. Dresser's 'Birds of Europe,' vol. vi. p. 187, two woodcuts are given of the breastbone of the Gannet, with remarks by the late Mr. John Flower, who points out that the coracoids are articulated in a direction nearly parallel with the axis of the sternum, and not, as in most birds, at nearly right angles to it. This arrangement differs widely from that in the Cormorant, and appears to be the best suited for offering the minimum of opposition in the bird's diving progress. Another remarkable feature, which has been noticed by Montagu, Sir Richard Owen, Macgillivray, and Prof. Newton, is the system of subcutaneous air-cells which pervade almost the whole surface of the body, and are capable of voluntary inflation or exhaustion.

A White Pelican, *Pelecanus onocrotalus*, is mentioned by Sir Thomas Browne, and afterwards by Montagu, as having been shot in Horsey Fen, Norfolk, in May, 1663, but it was supposed to be one of the king's birds which had flown away from St. James'. Mr. Cecil Smith informs the Editor that early in April, 1883, he examined one which had been shot on Exmoor, and subsequently proved to have escaped from a travelling menagerie. There is no evidence to show that examples of either of the two kinds of Pelican which have their nearest haunts in south-eastern Europe have ever wandered to these islands; but in pre-historic times a species did inhabit our fens, and its bones have been exhumed in Norfolk.

HERODIONES. *ARDEIDÆ.*



ARDEA CINEREA, Linnæus.*

THE COMMON HERON.

Ardea cinerea.

ARDEA, *Brisson*†.—Beak long, strong, straight, compressed in a lengthened cone ; upper mandible slightly channelled, ridge rounded. Nostrils lateral, basal, pierced longitudinally in the groove, and half closed by a membrane. Legs long, slender, naked above the tarsal joint. Tarsi scutellate in front. Toes three in front, the outer united to the middle one by a distinct membrane ; one toe behind, directed inwards : claws long, compressed, sharp, the middle claw pectinated on the inside. Wings of moderate size ; the second quill-feather the longest in the wing. Tail of twelve feathers, short, nearly even.

* Syst. Nat. Ed. 12, i. p. 236 (1766).

† Ornithologie, v. p. 391 (1760).

The Common Heron is, as regards the British Islands, the most numerous and the best known of the group of birds now under consideration; and in the palmy days of falconry its breeding-places were almost held sacred; the bird was considered royal game, and penal statutes were enacted for its preservation.* Now, however, the Heron is disregarded, and left to depend on its own sagacity for its safety. During winter the Heron is watchful, shy, and often, although not invariably, solitary; but from the early part of February onwards, numbers may be seen resorting to some favourite haunt which they have probably occupied during the breeding-season for years in succession. At this time they resemble the Rooks in many of their habits, building like those well-known birds on high trees; and in such numbers do they associate, that Pennant mentions having counted more than eighty nests upon one oak at Cressy Hall, near Spalding, in Lincolnshire,—an estate then belonging to the Heron family. Sometimes Herons make their nests on precipitous rocks near the coast, as, in former times, at South Stack Lighthouse, near Holyhead, mentioned by Mr. Eyton, and at the Great Orme's Head; and, at the present day, on the Point of Ardnamurchan, among the crags covered with ivy and shrubs. They also build on the ground; sometimes, as in several parts of Ireland, on the bare hillside, or on the walls of ruins. The nest is of large size, having much the appearance of that of the Rook, but flatter and broader; it is formed of sticks, and lined with smaller twigs, fibre, and dry grass; and in it are deposited three or four eggs, of a uniform bluish-green colour, averaging in measurement 2·5 by 1·75 in. In England they are, as a rule, laid early in March, but occasionally, if the season is very mild, in January, for Mr. J. Young took nestlings on the 23rd February, 1884; and even in the Highlands of Scotland young birds may be found by the middle of April. Incubation lasts about twenty-eight days; and it is stated that about a fortnight later a second clutch of eggs is laid and hatched off with the young birds in the nest (Stevenson, B. Norfolk, ii. p. 139).

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* The various names 'Heron,' 'heronsewe' for a young bird, 'hern,' 'hernshaw,' 'hanser,' 'hernser,' &c., have been referred to the Sanskrit 'hansa'; but Prof. Skeat does not venture so far back (Concise Etym. Dict. p. 201). Heron-shaw also means a wood wherein Herons breed (Cotgrave). In some parts of Great Britain and in Ireland a Heron is called a 'Crane'; it is also misnamed Stork,' *e.g.* Storks-wood, near Beverley.

When the young are hatched, both parents assist in providing them with food until they are able to fly, and have learned to supply themselves. Previous to this time, when the heronry is visited by strangers, the old birds leave their nests, and, circling high above the trees, betray great anxiety till the intruders have retired. The heronries are occupied from spring till August; and during winter a few birds are to be seen, as though they were paying occasional visits to maintain the right of occupation. Both Bewick and Heysham refer to the annual battles which took place at Dalham Tower in Westmoreland, between the Herons and the Rooks for the possession of particular trees; Hunt, in his 'British Ornithology,' mentions similar contests at Acle, in Norfolk; and at Malin Hall, co. Donegal, the Editor observed that the two species never retired to roost without a skirmish, in which the Rooks were the aggressors.

In the former Editions of this work the Author gave a catalogue, in alphabetical order of English and Welsh counties, of the heronries then known to him; and subsequently Mr. J. E. Harting, in 'The Field,' and in 'The Zoologist' for 1872 (p. 3261), published an amended list. The following, based upon the latter, and brought down to date, with the assistance of Mr. Harting, Mr. J. H. Gurney, jun., the Hon. A. N. Curzon, and others, who have kindly contributed, is believed to be tolerably correct; but considering the wandering nature of the birds, and their resentment of interference, it is impossible to hope for more than approximate accuracy. It must also be stated that many of the large colonies of former days no longer exist, or are considerably reduced; and even some of those now enumerated contain but few pairs.

Berkshire.—Two in Windsor Great Park; one in Coley Park, Reading.

Breconshire.—Scattered pairs breed all over the county, sometimes, as at Senny Bridge, to the number of half a dozen; but there is no large heronry (Zool. 1882, p. 216).

Caermarthenshire.—Neuadd-fawr, Cilcwm, near Llandovery: about 100 birds (Zool. 1882, p. 217).

Cambridgeshire.—Chippenham Park.

Cardiganshire.—Gogerddan.

Cheshire.—Aston Hall, near Frodsham; Tabley Park; Hooton-on-the-Mersey; Eaton Hall, near Chester; and a small one at Burton Hall.

Cornwall.—One on the river Lamorran, near Truro; one near Fowey; one on old oak-trees in Trenant Wood.

Cumberland.—Greystoke; Wythrop Woods, near Bassenthwaite; Gobay Park, and Edenhall, near Penrith; Eamont River, below Ulleswater; Muncaster Castle.

Denbighshire.—Vorlas Hall.

Derbyshire.—Kedleston, near Derby, about 20 nests in the tallest sycamores; Eaton Wood, near Uttoxeter; Sutton Scarsdale, near Chesterfield, about a dozen nests in April 1884.

Devonshire.—Powderham Castle, near Exeter; Sharpham, on the Dart; Warleigh, on the Tamar; Bellever, Dartmoor; Fremington, near Barnstaple; Shute Park, near Axminster; Pixton Park, near Dulverton.

Dorsetshire.—Brownsea Island, near Poole; Upton, near Wimborne; Bryanstone Park; Admiston Hall, Kingston Lacy; Sherborne Park.

Durham.—Ravensworth Castle; Sands, near Sedgefield; Gainford; Wycliffe.

Essex.—Wanstead Park; Sir John Tyrrell's, near Chelmsford; Chest Wood, Layer de la Haye: nearly 100 nests in 1877; St. Osyth Priory.

Flintshire.—Bodryddan, by St. Asaph: a large colony on old elm-trees close to the house.

Glamorganshire.—Hensol Castle, a large heronry in ash and maple trees; others at Margam Abbey and Penrice Castle, in oak-trees.

Hampshire.—Heron Court; Vinney Ridge, New Forest;

a small and recent colony in Wolmer Forest, on Scotch firs.

Herefordshire.—One in a wood of large oaks, near Hay, on the borders of Brecon.

Kent.—Cobham Hall; Penshurst Park; Chilham Park, near Canterbury.

Lancashire.—Ashton Hall, near Lancaster, in lofty ash and beech trees; Claughton Hall, Garstang, on elms and sycamores; Rigg's Wood, near Garstang; Scarisbrick Hall, near Ormskirk, on high larch and birch trees.

Lincolnshire. — Skillingthorpe Wood, near Lincoln; Swanpool; Evedon Wood, Haverholme Priory, near Sleaford, 40 pairs; Manby, near Brigg, reduced from 30 nests to 7 in 1884.

Merionethshire.—Talgarth Hall, Machynlleth; Rüg, near Corwen; Glyn Hall.

Middlesex.—From inquiries recently made on the spot, the Editor believes that a small colony still exists at Osterley Park.

Monmouthshire.—Pantygoitre; Court Blethyn; Treowen, near Monmouth.

Montgomeryshire.—Peniarth.

Norfolk.—Gunton, 38 nests in 1883; Didlington, 70 nests in 1883; Earlham, 25 nests in 1883; Mautby, reduced from 100 to 7 nests; Wolferton Wood, near Castle Rising; Kimberley; Old Buckenham, 6 nests; Burnham Overy; East Walton; Taverham Hall, near Norwich; Stokesby, near Acle; Westacre; Billingford; Spixworth, where the nests are in Portugal laurels; Holkam, 33 nests in 1879; Strumpshaw, near Brundall.

Northampton.—Althorpe; Milton, near Peterborough; Bulwick.

Northumberland.—Chillingham Park; Harbottle Castle, Upper Coquetdale, nearly 30 nests in Scotch firs; Bolam Lake, near Wallington; Redewater; Unthank, South Tyne.

Nottingham.—Clumber Park, a large colony; small ones in Colwick Park and Thoresby Park.

Oxfordshire.—A small colony in Far Wood, Southleigh.

Shropshire.—Altingham, 30 or 40 nests; Ellesmere; Plowden; Halston; Oakley.

Somersetshire.—Picton; Brockley Woods; Knowle House, near Dunster; Halsewell, near Bridgewater, 30 or 40 nests.

Staffordshire.—Swithamley; Trentham; Betley.

Suffolk.—Cavenham and Chippenham; Henham Hall; Friston, on the Orwell; Orwell Park.

Surrey.—Cobham Park; Ashley Park, Walton-on-Thames; scattered nests in Richmond Park.

Sussex.—Windmill Hill, Hurstmonceaux, 50 nests in 1879; Sowden's Wood, Brede, a very large colony; Parham Park, upwards of 100 nests.

Warwickshire.—Warwick Castle; Coombe Abbey; Ragley Park, near Alcester.

Westmoreland.—Dalham Tower; Rydal Lake; Ingmire Hall.

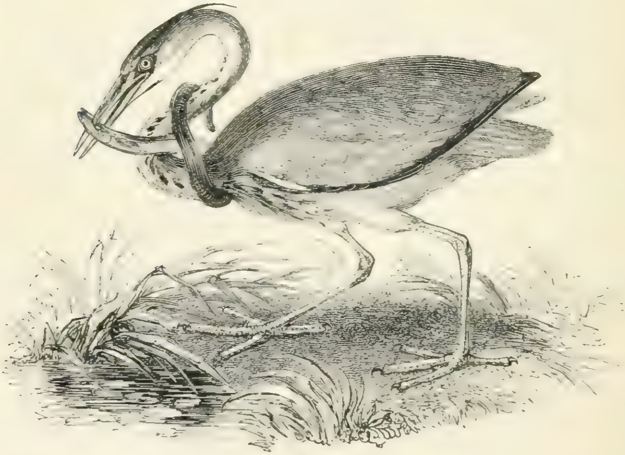
Wiltshire.—Bowood, near Melksham; Longleat, near Bath; Longford Park, near Salisbury.

Worcestershire.—Wedgwood Park, near Droitwich.

Yorkshire.—Kildale-in-Cleveland; Newton Hall, near Malton; Harewood Park, near Leeds; Eshton Hall, near Gargrave; Browsholme Hall, near Clitheroe; Nostell Priory; Morby Park, near York, about 50 nests (W. E. Clarke).

In Scotland there are comparatively few large heronries, but the small ones are so numerous that for a list of them the reader must be referred to Mr. Harting's paper, which also contains some interesting particulars respecting many of the colonies in Ireland. In the latter, the majority are in the counties of Cork, Down, Dublin, Mayo, and Waterford, but the species is so generally distributed that it would be futile to attempt the enumeration of its breeding-places.

The food of the Heron consists of fish, reptiles, small mammalia, mollusks, crustaceans, worms, and insects. When the Heron has only itself to provide for, it usually fishes late in the evening and on moon-light nights, and very early in the morning. Its appetite is voracious; but on the whole its services in the destruction of pike and other coarse fresh-water fish, water-rats, and water-beetles, may fairly be set off against its depredations in trout-streams. When the occasion presents itself it will undoubtedly devour the young of water-fowl. Mr. Newcome told Mr. H. Stevenson that he once knew a Heron to swallow a Stoat, but in this case the prey was promptly disgorged. For another example of "the biter bit" the Author was indebted to the kindness of the late Rev. W. Alderson, of Ashton, near Sheffield, for the use of a clever drawing, from which the vignette below was taken. A Heron was seen one evening going to a piece of water to feed; the spot was visited the next morning, when it was discovered that the Heron had struck its sharp beak through the head of an eel, piercing both eyes; the eel thus held had coiled itself so tightly round the neck of the Heron as to stop the bird's respiration, and both were dead.



When fishing, the Heron stands motionless in shallow water, with the head drawn back towards the shoulders, ready to strike or seize with its sharp beak whatever may happen to come within its reach. If an eel chance to be the object caught, the Heron has been seen to quit the water to make the more sure of the prey, by beating it against the ground till it was disabled. The alarm-note is a loud 'frank, frank,' which never fails to disturb any water-fowl in the vicinity; but at the nest it is a prolonged 'kronk' or 'kraak.'

Selby states that a pair of Herons, kept by Dr. Neill in his garden at Canonmills, near Edinburgh, produced two sets of eggs; during incubation the male frequently took his place on the nest when the female went off to feed, but unfortunately both the female and the eggs were destroyed by accident. Dr. Neill adds, "A large old willow-tree had fallen down into the pond, and at the extremity, which is partly sunk in the sludge, and continues to vegetate, Water Hens breed. The old cock Heron swims out to the nest, and takes the young if he can. He has to swim ten or twelve feet, where the water is between two and three feet deep. I have seen him fell a rat at one blow on the back of the head, when the rat was munching at his dish of fish."

The Heron was formerly esteemed as an article of food, and Mr. Gurney states that the young are excellent eating just before they leave the nest. Up to that time their diet consists almost exclusively of fish, the taste for fur and feather being acquired later. According to Folkard, the price of a Heron in the time of Edward I. was from sixteen to eighteenpence: higher than that of any other wildfowl; but by the reign of Elizabeth the bird had fallen in favour, although still held in some repute.

The Heron appears to be a long-lived species, and, amongst other instances, Mr. H. Stevenson quotes a statement in 'The Annual Register' for 1767 (p. 107), under date of July 7th, recording the capture by the Prince Stadtholder of Holland, of a bird with a brass inscription round its leg, setting forth that it had been taken and released by the Elector of Cologne in 1737. Dr. L. Companyó records the capture of an adult near Perpignan, in the extreme south-east of France, in April 1845, bearing the badge of the Hawking Club of Loo, in Holland, dated 1843; another, which had carried the inscription seven years, was killed there in 1856; and Colonel Hamilton states that one was shot in the province of Oran, Algeria, in 1858, bearing the label of the same Club for 1850. These facts are interesting, as proving that the migrations of the Herons are more extensive on the Continent, where the severity of winter is greater than in this country. Here they appear to be of a partial character, and, so far as can yet be judged from the Migration Reports, they have mostly been observed in autumn, and in the northern portions of our islands.

In the British Islands the Heron is generally distributed; but although found in the Outer Hebrides during the greater part of the year, it does not appear to breed there. It sometimes visits the Færoes; very rarely straggles to Iceland; and a young bird was found dead in South Greenland in 1856. On the coast of Norway its range extends to lat. 68° N.; but in Sweden and Russia its breeding limits do not go beyond 57°. South of this it is found in suitable localities over the greater part of Europe; but in France there is only one recognized heronry—a very large one—at Écury-le-grand, Champigneul, Marne. To the Iberian Peninsula the species is a winter visitor; and the same may be said of most of Southern Europe, with the exception of the northern and central districts of Italy, the valley of the Lower Danube—where Messrs. Seebohm and Young found it breeding in June,—and Southern Russia. Passing eastward, it nests throughout the temperate portions of Asia as far as China and Japan, and southwards to Ceylon; and it has occurred in Java and in Australia. It visits the Canaries, Madeira, and the Azores; and its range can be traced over the greater part of Africa, down to the Cape and Natal, but it seems probable that statements as to its nesting in the south relate to a very closely allied species, *A. melanocephala*. It has also been obtained in Madagascar and Mauritius.

In the adult male the beak is yellow; the lore yellowish-green; irides yellow; forehead and cheeks white; the long occipital feathers forming the plume bluish-black; upper surface of the body and wings french-grey; wing-primaries black; tail-feathers slate-grey; neck white, varied in front throughout its length with dark bluish-grey, forming elongated spots: and terminating in long white feathers covering the chest; under surface of the body greyish-white, streaked with black; legs and toes greenish-yellow; claws brown. Length, from the point of the beak to the end of the tail, about three feet; from the carpal joint to the end of the wing, eighteen inches. In the females the colours are not quite so bright, and the plumes are shorter than in the males.

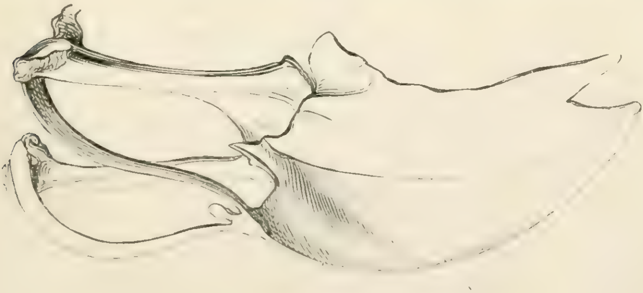
A young male bird is stated by Mr. Rocke (Zool. s.s. p. 81) to have assumed the long pendulous crest-feathers at the age of four months; but, as a rule, these are shorter during the first and second years, and there are no long feathers at the bottom of the neck; head and neck ash-colour, with dull dusky-grey streaks in front; the upper mandible of the beak greenish-brown, the under mandible yellow; the legs darker in colour, almost brown, and the grey plumage on the upper surface of the body and wings tinged with brown.

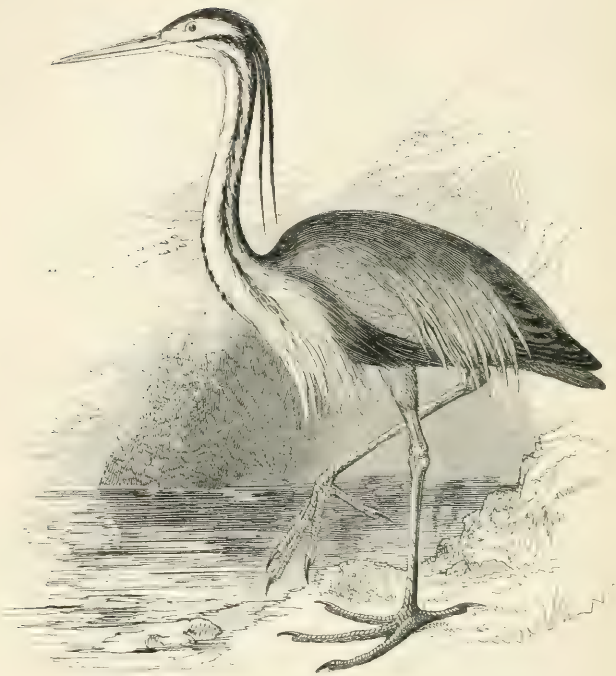
When just hatched the nestling is helpless, and is covered with a pale hair-like down.

Varieties are sometimes obtained; one in the Museum of Science and Art at Dublin has the darker portions of the plumage indicated by a creamy-buff with streaks of umber-brown.

The members of this family have the breast and lower flanks furnished with well-developed powdery tufts of decomposed feathers, the use of which is not known.

The vignette below represents the breastbone of the Common Heron, about one-third less than the natural size.





Ardea purpurea, Linnæus.*

THE PURPLE HERON.

Ardea purpurea.

The Purple Heron may perhaps have been known to Sir Thomas Browne, more than two hundred years ago, as an accidental visitant to this country, for the description of his "Black Heron" seems to refer to this species. In the present century, its occurrence was first made known by Montagu, who mentions two specimens, one of which was shot in Ashdown Park, near Lambourn, Berks, and passed into the Leverian Museum; and it would appear from Hunt's "British Ornithology" that an example was obtained near Ormesby, in Norfolk, probably, as Mr. Stevenson observes, the same bird which, in Sir William Hooker's MS. is described as shot at Filby in 1810. In the month of May, 1830, according to Selby, two adults were obtained in Norfolk; and since that date, according to Mr. H. Stevenson and Mr. J. H. Gurney, jun., the Purple Heron has occurred in that county about seven times:—once in July, twice in September, twice in October, once in November, and once in December; nearly all of them being immature birds, and five of them being obtained in the Broad district. Several have been obtained in Suffolk, and two of these, shot near Lowestoft, in 1833, in the Lombe collection, are in adult plumage. In Lincolnshire one was shot on the Witham; and in Yorkshire Mr. W. E. Clarke records five occurrences, mostly in spring and summer, between 1833 and 1863. In Nottinghamshire one was killed at Clifton, on the Trent, in 1868. In Sussex Mr. A. E. Knox records an example shot at Worthing in September 1848; and Mr. J. C. Mansel-Pleydell mentions two obtained in Dorset. In Devonshire Dr. Edward Moore notices the capture of two young birds, to which Mr. Plumptre Methuen added one shot near Plymouth, and Mr. Gatcombe found a young one hanging up in a poulterer's shop in Stonehouse. The late Mr. Couch of Polperro sent Bewick a drawing from a specimen which alighted on a fishing boat two or three leagues from the coast of Cornwall, and Mr. Rodd has recorded three more examples obtained in that county, two of them in April; and one in the Scilly Islands, in September. In Wales this species is still more rare, but Mr. E. C. Phillips mentions that one out of three was shot near Talybont, on the Usk, in Breconshire. Mr. R. C. Musgrave informed Mr. Gould that one was shot about 1850 near Alston, in Cumberland. In Ireland the example in the Warren collection, killed at Carrickmacross in 1834, and now in the Museum of Science and Art, Dublin, is the only one on record. As regards Scotland, Mr. R. Gray mentions one killed in Caithness prior to 1841; and Macgillivray has cited another obtained in March 1847, in Aberdeenshire. A few more examples have, doubtless, occurred in the British Islands, but enough have been mentioned to indicate that this species is an irregular visitant to our eastern and southern shores, becoming extremely rare in the western districts. Considering its comparative abundance on the neighbouring shores of Europe, it is perhaps somewhat remarkable that its visits should be so few and far between.

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* Syst. Nat. Ed. 12, i. p. 236 (1766).

The Purple Heron is a mere straggler to the south of Sweden, and it is of rare or very local occurrence in Northern Germany. Its nearest breeding-places are in Holland, where it is still by no means uncommon, although some of its haunts have been interfered with by drainage. To Belgium, and to the northern districts of France, it is principally a visitor on passage, but it breeds in considerable numbers in the marshes of the Loire, and in some parts of the south and east. In the Spanish Peninsula it nests in suitable localities, as it does over the rest of Europe, from Central Germany southwards; but it appears that the majority migrate from the countries on the northern side of the Mediterranean in winter. In Poland, according to Dr. Taczanowski, it is on the whole rare; nor is it common in Austria or Hungary, although it becomes abundant in the valley of the Lower Danube and in the marshy districts of Southern Russia. In Asia it is generally distributed in well-watered localities, from the Mediterranean and the Caspian to the Philippines and the Indian Archipelago, and it is resident in the warmer portions; but it is rare in North China, and its recorded occurrence in Japan is open to doubt. Even from the greater part of Northern Africa—with the exception of Egypt, where it is resident—it appears to be partially migratory in winter, at which season this species is exceedingly abundant throughout the rest of the continent; and, in addition to these migrants, large numbers permanently inhabit the marshy districts down to Cape Colony. It has even been found up to an elevation of 9,000 feet in Abyssinia; and it has been met with in Madagascar.

The Purple Heron is partial to still waters and reedy marshes, and in Europe its breeding-places are, as a rule, exceedingly difficult of access, being generally situated in the midst of dense masses of reeds, where wading is almost impossible. Mr. Alfred Crowley, who visited the Naarden Meer, near Amsterdam, on the 27th of May, 1884, describes the nests as placed about three feet above the water, and made by bending down twelve or fifteen reeds to form a platform, on which some smaller pieces were arranged crosswise, and this agrees with the Editor's experiences in Spain. In Ceylon, however, Colonel Legge and Mr. Nevill found this species breeding on trees, and forming flat but rather bulky nests. The eggs are usually three in number, and are of a bluish-green colour, somewhat paler and smaller than those of the Common Heron: average measurements 2·2 by 1·5 in.

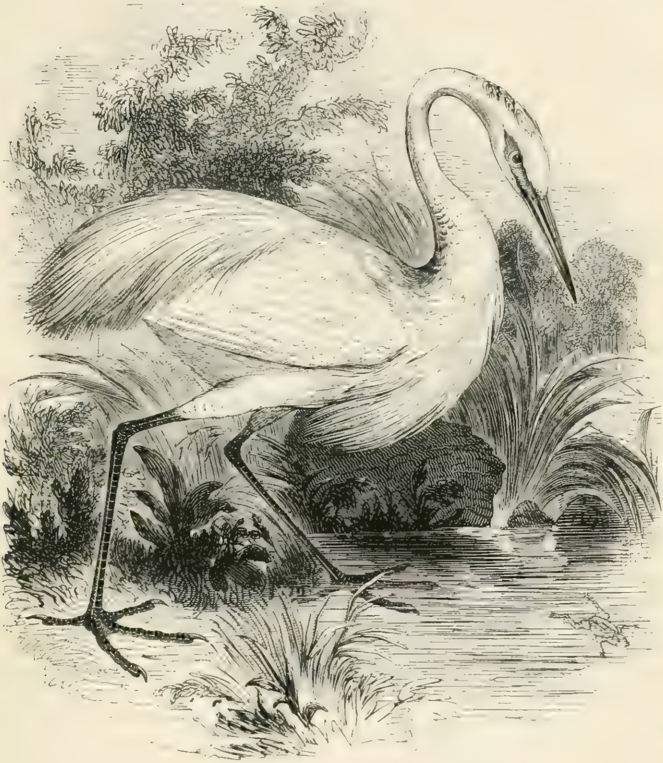
In its habits the Purple Heron is more like the Bittern than the Heron last described, and it is shy and, to a considerable extent, crepuscular, and even nocturnal, in its time of feeding. From the thinness of the long snake-like neck, the birds, even when numerous, are with difficulty distinguished when they are standing in a reed-margined lake, nearly up to the belly in water, their bodies, in the shimmering sun-light, exactly resembling tussocks of reed. The flight is similar to that of the Common Heron, but the note is more guttural. The food of this species consists of small mammalia, reptiles, fishes, and aquatic insects. Mr. Stevenson found that two birds which he dissected were extremely fat; the stomach of one contained two good-sized roach—one quite five inches long:—in the other was merely a dry pellet of mouse-hair.

The adult bird has the beak yellow, darkest in colour at the base; the lore greenish-yellow; irides bright lemon; the top of the head, the occiput, and the long occipital plumes, glossy black, tinged with purple; cheeks and sides of the neck fawn-colour, with descending streaks of bluish-black; back and wing-coverts dark slate-grey; the elongated filamentous dorsal feathers, chestnut; tail-feathers bluish-grey, the two central feathers dark slate-grey; chin pale buff; neck reddish-buff, the elongated feathers at the bottom of the neck in front a mixture of pale buff, chestnut, grey, and black; under wing-coverts chestnut, the colour appearing outside the point of the shoulder; the breast rich maroon-red; the belly a mixture of maroon and dark grey and black; flanks ash-grey; thighs reddish-buff; tibia and inner edge of tarsus, with the soles, citron-yellow, the rest of tarsus and feet pale brown; toes long and slender; claws black.

The whole length, from the beak to the end of the tail, is about three feet. From the carpal joint to the end of the wing, fourteen to fourteen and a half inches. Weight from 2 lbs. to 2 lbs. 14 ozs. The adults of both sexes are alike in plumage, but the male is the larger.

The young birds, till their second moult, are usually without the occipital crest, as well as the elongated feathers at the base of the neck and on the scapulars. The chin is white; the forehead blackish-grey; the crown and occiput grey, tinged with reddish-brown; the neck is pale reddish-brown, without the black lists; the front of the neck is yellowish-white, with longitudinal black spots; the back, scapulars, wings, and tail, deep grey; the feathers margined with reddish-brown; the belly and thighs reddish-white. The upper mandible is blackish-brown; the under one, lores, and eyes, pale yellow.

The following is the description of a nestling taken by the Editor near Valencia, in Spain, on the 29th May:—Skin and feet yellowish-green, yellow on abdomen; upper mandible greenish horn-colour, lower mandible yellow; iris pale straw-yellow; feathers reddish-brown; hairy crest; shafts of feathers lead-blue; all edged with white down, whitest on abdomen; claws horn-white. The cry for food was 'kick, kick, kick,' harsher when the bird was irritated.



ARDEA ALBA, Linnæus.*

THE GREAT WHITE HERON.

Ardea alba.

THE GREAT WHITE HERON can only be considered as a very rare and accidental visitor. Latham, in his 'General History of Birds,' refers to one example said to have been obtained in Cumberland many years ago, and this may, perhaps, be the example cited by Mr. J. Robson in his List of the Birds of West Cumberland (Zool. p. 4169), as killed at Buttermere. Montagu, in his Supplement, says that a White Heron made its appearance on the borders of the river Avon, in Devonshire, in the autumn of the year 1805, where it was frequently observed by the Rev. Mr. Vaughan, in company with three or four of the common species, and sometimes alone; but its extreme wariness disappointed the many attempts to shoot it, although it continued within the range of a few miles for two months. Messrs. Sheppard and Whitear, in their Catalogue of the Norfolk and Suffolk Birds (Trans. Linn. Soc. xv. p. 40), say, "that on the 3rd of October, 1834, in a walk on the banks of the river Stour, we observed a large White Heron cross over from the Suffolk to the Essex side of the river. It appeared to be pure white, and to stand up rather taller than some Common Herons, which were feeding not far off. A similar bird was observed in the spring on the Oakley shores; and, subsequently to our observation, one was seen on the banks of the river Orwell." A specimen, formerly in the collection of the late Mr. Thurtell of Eaton, appears, according to Mr. J. H. Gurney, jun., to have been mounted from a skin, and not from the flesh.

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* Syst. Nat. Ed. 12, i. p. 239 (1766).

The earliest proof of the occurrence of this species in England, was supplied by Mr. Arthur Strickland in a communication made to the British Association, at its meeting at Newcastle in August, 1838 (Report Trans. p. 106), in which he stated that "twelve or thirteen years previously a bird of this species was seen for some weeks about Hornsea Mere, in the East Riding of Yorkshire, and was some time after presented to the Author, in whose collection it then was in perfect preservation." Mr. Strickland added that "another, in full summer plumage, was killed by a labourer in the fields of Mr. James Hall, of Scorborough, near Beverley, about three years ago, and was in the possession of that gentleman;* and a third specimen of this bird was in the collection of Mr. Foljambe, of Osberton, near Worksop [in Nottinghamshire], with a label on the case stating it to have been killed near that place." A third Yorkshire example, shot at New Hall, near Barnsley, in 1821, is in the possession of Sir Joseph Radcliffe (Clarke, Yorks. Vertebs. p. 50). The Author received a notice of one killed in Lincolnshire, but where the specimen was deposited he did not know; and Mr. Frederick Holme sent him the measurements of a specimen shot on the Isis in Oxfordshire, in September, 1833. An adult male killed on the 9th of June, 1840, on Tyninghame sands, in the Frith of Forth, by Mr. Martin, gamekeeper to the Earl of Haddington, is in the collection at Tyninghame House, and was examined in a recent state by Macgillivray. Lastly, one shot on Thorney Fen, Cambridgeshire, in 1849 (Zool. p. 2568), is now in the possession of Mr. Charles Isham Strong, of Thorpe Hall, Peterborough. It has the ornamental plumes on the back, and is said to have been killed between the 1st of May and the 14th of July.

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* The former is now (1884) in the Strickland collection in the Museum at York, and Mr. W. E. Clarke gives the date of its capture as "winter of 1821" (Yorks. Vertebs. p. 50). The second is now, according to the same authority, in the Rudston collection in the York Museum.

There are also statements as to this species having been recognized, but not obtained; for instance, according to Mr. Thomas Edward, on the Loch of Strathbeg, and again on the coast of Banff; on the Solway and in various parts of Scotland in severe winters; on Romney Marsh, Kent, by moonlight; and near Penzance. But dismissing these records for what they may be worth, it would appear that at least six British-killed specimens are still available for examination.

On the Continent this beautiful species of Heron was included in the Swedish Fauna by Linnæus and Retzius, who say of it, *Habitat in Scania, visa ad Araslof;* and Mr. Dresser states, on the authority of Dr. Sundström, that five examples have been obtained in Sweden between November, 1856, and May, 1877. To the western portions of Europe and to the Azores it is merely a straggler, but it not unfrequently visits the eastern coasts of Spain, and the marshes of the south of France, breeding, according to Dr. Companyó, until quite recently, near Perpignan. Alexander von Homeyer found a single pair nesting near Glogau in

Silesia, in the summer of 1863 (J. f. O. 1863, p. 440); but on the whole this species may be considered as rare to the north of the valley of the Danube, where it formerly bred in considerable numbers, although it has now become scarce, owing to persecution for the sake of its plumes. In the marshes of Sicily and Sardinia it is tolerably abundant, especially in winter, and it visits most of the islands and the south-eastern shores of the Mediterranean. In Macedonia Messrs. Elwes and Buckley found it common in February, in which month an adult male had the long plumes of the back fully developed; and it breeds in Bulgaria, Turkey, and the southern and central districts of Russia. Eastward it has been met with in suitable localities in Asia Minor, Turkestan, and the warm and temperate portions of Asia as far east as Manchuria and Japan. From the more northern districts it migrates in winter; but in India, Ceylon, Burmah, and China a form is resident in which the average measurements are smaller than in European examples. In North Africa, from Morocco to Egypt, it principally occurs in winter; and in Abyssinia it has been found at an elevation of upwards of 9,000 feet. It is said to occur in South Africa, but there is some doubt as to the accuracy of the identification. The same remark applies to the species of Great White Heron found in Australia and New Zealand, and which is said to have the bill yellow at all seasons of the year, whereas our bird has the bill black in summer and yellow in winter. In America there is a closely-allied species, *A. egretta*, which has a yellow bill at all seasons, and the tarsi and tibiæ are always black.

The nest of the Great White Heron found by A. von Homeyer, was slightly built and placed on an old fir-tree, and three young birds which had apparently been hatched a few days were found in it on the 28th of June. The largest of them had left the nest and flown to the nearest tree on the 22nd of July, when it was secured and sent to the Berlin Museum, and subsequently the remaining young birds and one of the parents were shot, the survivor leaving in August. In India, where the breeding-time depends upon the rains, this Heron nests from October to February in groves of trees, the trunks of which are submerged in the wet season. In Ceylon, Colonel Legge describes it as nesting on the same trees with other Herons, Spoonbills, and Pelican-Ibises; the surface of the nest being almost flat, with scarcely any hollow for the reception of the eggs, which are laid on a lining of roots and twigs. The eggs are three or four in number, of a pale greenish-blue colour, and average in measurements 2·5 by 1·5 in.

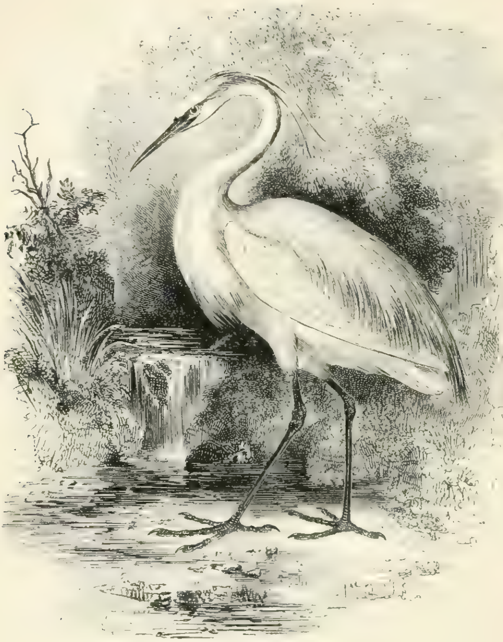
The food of this species consists of small fish, reptiles, mollusks, and aquatic insects. Colonel Legge says that "it leaves its feeding-grounds early in the evening, and resorts at once to the tall trees on which it nightly roosts. It is as a rule a silent bird, but, when put up, now and then utters a single note like *kar*."

Adult birds have the beak black during the breeding-season, turning to yellow in autumn; the lore and bare space round the eye, pale green; irides yellow; the whole plumage white; the feathers of the back of the head very slightly elongated; those at the bottom of the neck in front, more so; the interscapulars and dorsal feathers very long and filamentous in spring, but absent in autumn; legs, toes, and claws almost black: the tibia paler.

Adult males and females are alike in plumage, but the former are the larger and have the plumes more developed.

The whole length from the point of the beak to the end of the tail is about three feet four inches. From the carpal joint to the end of the wing, seventeen or eighteen inches; length of the tarsus seven inches and a half.

Young birds do not acquire the elongated feathers during their first or second year; the bill is yellowish and the legs are paler. A nestling from the Lower Volga, lent to the Editor by Mr. E. Bidwell, is covered with long hair-like greyish-white down; the bare skin of the throat is livid; the bill yellowish, black at the tip; legs and feet yellowish.



Ardea garzetta, Linnæus.*

THE LITTLE EGRET.

Ardea garzetta.

The Little Egret is one of the rarest stragglers to the British Islands, and some of the records of its reported occurrence are far from being satisfactory.† Templeton, in his 'Catalogue of the Vertebrate Animals of Ireland,' says of this bird, "There is a specimen in the Dublin Museum, which was shot in the harbour of Cork, in 1792"; and Thompson states that there is an entry in the Donation Book of the University Museum of that city, dated December, 1788, recording the presentation by the Rev. J. Elgee, Wexford, of "a bird of the species called the Small White Heron, whose present existence in the British Islands has been doubted." These specimens have long since disappeared. Little reliance can be placed upon the statement in Pennant's 'British Zoology' (Ed. 1812, ii. p. 21), "We once received out of Anglesey the feathers of a bird shot there, which we suspect to be the Egret." The Rev. Robert Holdsworth, of Brixham, to whom the Author was indebted for many valuable communications, sent word that in 1816 a bird was shot on Flatoars, on the river Dart, which exactly corresponded with the description of the Egret in Montagu's Ornithological Dictionary as a bird of the second year, being tinged with grey on the neck and breast. The Rev. L. Jenyns, in his 'Manual of British Vertebrate Animals' (p. 188), says, "In April, 1824, two specimens are recorded to have been killed at Penzance, in Cornwall, and one of them to have been preserved"; but Couch, in his 'Cornish Fauna,' only says vaguely that one or two specimens are known, and in the Edition of 1878, the species is omitted from his list. However, Fox, in his 'Synopsis of the Newcastle Museum' (p. 254), quotes a letter from H. Mewburn, dated St. German's, 7th March, 1826, in which he speaks of a pair of Egrets obtained during the past eighteen months. Mr. J. C. Dale, the well-known Entomologist, states (Mag. Nat. Hist. ix. p. 598), that he had a memorandum of an Egret having been shot near the river Stour, at Christchurch, Hants, in the beginning of July, 1822, by the late Mr. William Lockyer, who sold it to Mr. Barrow, of Christchurch, by whom it was preserved.* Mr. Dale goes on to say that in March, 1826, at a sale in Southampton, an Egret, supposed to have been shot in the neighbourhood, fetched £5 5s. Upon this the late W. Christy, jun., adds (p. 647) :— "I have a very fine specimen of the Egret, said to have been shot at or near Sutton Coldfield, in Warwickshire. I bought it of a very respectable bird-stuffer, who assured me he had received the bird direct from the person who shot it. Still I confess I had my doubts, and bought the skin more for its beauty than as an authentic British specimen. However, during a visit in April last to Lord Mount Norris, at Arley Hall, I happened to meet with a gentleman who assured me that within the last few years he had known of three specimens of the Egret, and two of the Little Bittern, having been shot at Sutton Coldfield. I therefore think there is no doubt of its occurrence in this country, though it must be classed among our rarest birds." A bird in the collection of Dr. Diamond of Twickenham, labelled as "shot by Roger Stoughton, near Sparham, Norfolk, 1831," has proved to be the American species *Ardea candidissima* (Tr. Norw. Soc. iii. p. 565), but the specimen is known to have been stuffed by Hadgraft, who had dealings with America, and an unintentional substitution is more than probable.

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* *Ardea Garzetta*, Linnæus, Syst. Nat. Ed. 12, i. p. 237 (1766).

† The often quoted passage from Pennant, identifying with this species the thousand 'Egrittes' served at Archbishop Nevill's enthronization-feast, in the time of Edward IV., is probably founded on an error. As suggested by Fleming, and accepted by Selby, the birds were, no doubt, Lapwings. The word *aigrette* (whence *Egret*) is probably derived from the Italian *aghiróne*, a heron: Provençal *aigró*; and has acquired the meaning of a tuft of feathers.

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* Mr. E. Hart of Christchurch informs the Editor that this example passed into the hands of Capt. Cox, at whose sale Mr. Hart purchased it. He cannot trace a bird said by Mr. Wise to have been shot near Hayle (*cf.* J. H. Gurney, jun., Zool. s.s. p. 1512).

Gould, in his 'Birds of Great Britain,' vol. iv., gives the following particulars, furnished by Lord Hotham, respecting a specimen belonging to Mr. James Hall, of Scorborough, near Beverley, who writes : "The Little Egret in my possession was killed by a labourer with a stick in Ake [Aike] Carr, near Beverley, about 1840, and was brought to me, tied up in a pocket-handkerchief, covered with black wet mud and blood, in which state it was sent to Mr. Reed, of Doncaster, who restored it in a marvellous manner." Another Yorkshire occurrence rests on the authority of Mr. Robert P. Harper, who states (Zool. 1881, p. 213) that an example in very fair plumage, but wanting the long occipital feathers, was then in the possession of Mr. Thompson, a bird-preserver, and had been shot near Haybourn Wyke, near the town of Scarborough, on the 4th January, 1881 ; a remarkable time of year for a species which hardly winters to the north of the Mediterranean. Mr. J. H. Gurney, jun., states that there is an example in winter dress in the Museum at Wisbeach, labelled 'South Lincolnshire, December 1851'; but so far as he and Mr. Cordeaux can make out, it was given as a skin by the Rev. F. Latham, of Helpringham, who thinks that he got it in Hampshire ('Rambles of a Naturalist,' p. 284). Mr. A. E. Knox was informed that a specimen in the collection of Sir Percy Shelley was shot a few years prior to 1855 at Warnham Mill-pond, in Sussex.

Last, and most satisfactory of all, is the record by Mr. J. Gatcombe (Zool. s.s. p. 2308) of an adult which he examined, recently killed at Countess Weir, on the river Exe, on the 3rd June, 1870, and then belonging to Mr. E. H. Harbottle, of Topsham, near Exeter.

The Little Egret has not been known to occur beyond the Baltic, and it is a rare visitor to Germany, Holland, and the north of France. In the southern and eastern portions of the latter country, it is not uncommon; and it is tolerably abundant, in suitable localities, in the Spanish Peninsula, Italy, Sicily, Sardinia, and the countries bordered by the Mediterranean. The northern limit of its breeding-range appears to be in the wooded swamps of Slavonia, where Mr. W. E. Clarke found it nesting towards the end of May, 1883, on the Obedska 'bara,' a horseshoe-shaped marsh, on the river Save, not far from Semlin. In the same year Messrs. Seebohm and Young found this species breeding in colonies on the Lower Danube. It is common during the breeding-season in Turkey and in Southern Russia; and it has been observed in Asia Minor, Palestine, and Persia. In many parts of India, and in Ceylon, it is resident; the nesting-time in the north being from July to August, and in the south from December to January. Its range extends from the Caspian to Japan and China; it has been obtained in the Philippines and the islands of the Eastern Archipelago; and it visits the northern portions of Australia. In the west it is known to visit the Azores, the Canaries, and the Cape de Verde Islands; it frequents the marshes of Northern Africa, and appears to be found over the rest of that continent down to Cape Colony, although necessarily local in its distribution.

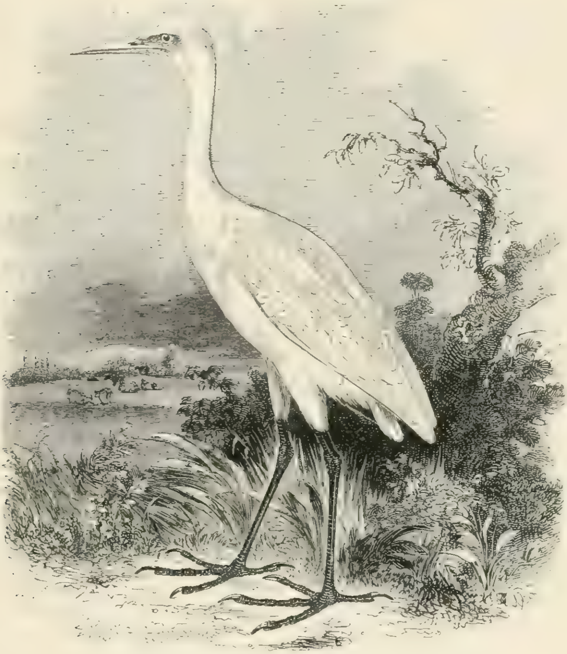
The nests of the Little Egret are usually placed in bushes and trees, together with those of other swamp-loving species; the material consisting of sticks and a few reeds, on which are deposited the eggs, varying from three to six in number: of a pale bluish-green; averaging 1·8 by 1·3 in. Dr. H. Gadow informs the Editor that he shot examples of this species on the 17th April, 1884, round an isolated rock on the south coast of Portugal, on the inaccessible summit of which this species appeared to be breeding, together with some species of Gull. Mr. Seebohm describes this bird as being very noisy, and uttering a note of alarm or defiance resembling the syllables *ak*, *ark*, and *ork*.

The food of the Little Egret consists of small fishes, aquatic insects, frogs, and worms.

The adult bird in spring and summer has the beak black; the lore lavender; the irides vary from yellow to pale lavender; the whole of the plumage a pure and delicate white; crest of two long narrow feathers; some elongated plumes at the bottom of the neck in front; feathers of the back greatly lengthened and filamentous; the legs mostly black, yellowish on the lower portions, as are also the soles of the feet; claws black. In winter the dorsal and occipital plumes are absent.

The whole length of the male is twenty-five inches; from the beak to the feathers on the forehead, three inches and a half; from the carpal joint to the end of the wing, eleven inches and a quarter; length of tarsus four inches; bare part above, two inches and a half. Females are rather smaller; but Mr. J. H. Gurney, jun., says that the plumes are sometimes equally developed.

Young birds are white with a greyish tinge, and have no elongated plumes. A nestling from the Dobrudscha, for which the Editor is indebted to Mr. E. Bidwell, is covered with a greyish down distinctly tinged with buff on the upper parts, and very different from the white of the preceding species.



ARDEA BUBULCUS, Audouin.*

THE BUFF-BACKED HERON. (Adult.)

Ardea russata.

THE first notice of the occurrence of this rare bird in England was communicated to the Linnean Society by Montagu on the 5th of May, 1807 (Trans. ix. p. 197); and a more detailed account of it, under the name of the 'Little White Heron,' was afterwards published in the Supplement to his Ornithological Dictionary, from which some of the following particulars are derived.

"This elegant little species of Heron, which was shot near Kingsbridge, in Devonshire, in the latter end of October, 1805, had been seen for several days in the same field, attending some cows, and picking up insects, which were found in its stomach. It was by no means shy, and was fired at a second time before it was secured. The situation where it was shot is the southern promontory of Devon, very near the coast, between the Start and the Prawl." It was placed in Montagu's collection by Mr. Nicholas Luscombe, of Kingsbridge. The specimen, which is a young bird, and proved on dissection to be a female, is still [1884] preserved in the British Museum. The Author learned from the Rev. Robert Holdsworth, that it was shot by Mr. F. Cornish, at South Allington, in the parish of Chivelstone.

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* Explication sommaire des Planches d'Oiseaux de l'Egypte, &c., i. p. 298, folio Ed. (1826); p. 391, 8vo. Ed. (1828).

In 'The Zoologist' for 1851 (p. 3116), there is a record by Mr. A. Clevland, that he had obtained a very fine specimen of the 'Little White Heron,' which was shot in the south of Devon in the month of April of that year, but no description or further particulars are given. Mr. H. Stevenson included this species in 'The Birds of Norfolk' (ii. p. 151), on the authority of Mr. Joseph Clarke, who informed him that a young bird killed at Martham, near Yarmouth, in 1827, was in the Saffron Walden Museum; but the specimen is no longer in existence, having been destroyed by moth; and as neither Mr. Stevenson nor Mr. J. H. Gurney, jun., mention the Buff-backed Heron in their recently published (1884) lists of Norfolk birds, it would seem that its antecedents have not borne investigation.

The Buff-backed Heron is essentially a southern bird; and Mr. W. E. Clarke records an adult male, shot on the Obedska 'bara,' on the 29th of May, as the first known occurrence in Hungary or her provinces (Ibis, 1884, p. 146). On the Danube it appears to be almost unknown, and although stated by Filippi to swarm on the Caspian, there can be little doubt that he mistook for it the Squacco Heron which has proved to be abundant there, but which he does not mention (Ibis, 1884, p. 429). It is a very rare visitor to the south of France, Italy, Sicily, Malta, and Greece;

and at present its only known breeding-haunts in Europe are the southern portions of the Spanish Peninsula. There, from March to autumn, this species is very common in the marshes of Andalucia, where thousands may be seen amongst the cattle, on the backs of which they may often be seen, picking off ticks; whence their name among the country-people of 'Purga-bueyes,' a corruption of 'Espulga-bueyes,' meaning 'cattle-cleaners.' This Heron is said to have occurred in Madeira. In North Africa, from Morocco to Egypt, it appears to be abundant in suitable localities, and it is to a great extent resident throughout the year; its distribution extending over that continent down to Cape Colony. It is also common in Madagascar, where Mr. E. Newton thinks that its breeding-season is in September. In Asia, its range is only known to reach to Palestine; for in India, Ceylon, Burmah, South China, and South Japan, it is replaced by a closely-allied species, *Ardea coromanda*, which is rather larger, has a longer bill, narrower at the base, the rufous portion of the breeding-dress is a rich orange-colour and extends over the whole neck, and a large part of the tibia is bare of feathers.

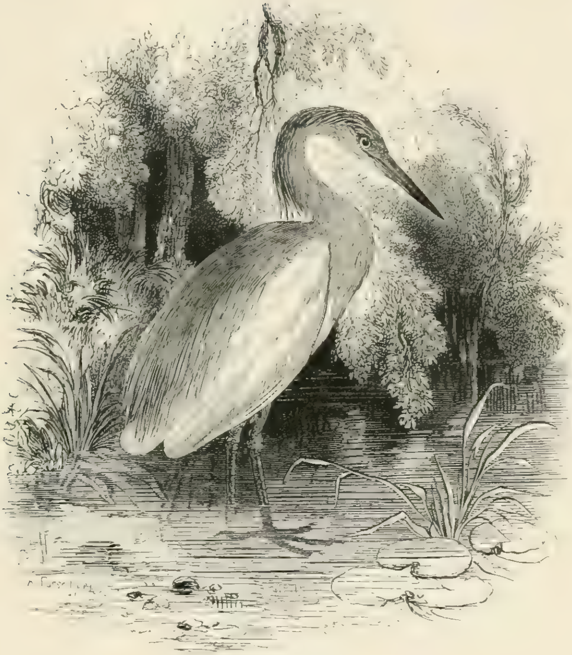
Like its congeners, the Buff-backed Heron breeds in colonies, making a nest of dry sticks and twigs in the reeds of swamps, or in trees: sometimes, according to Von Heuglin, in gardens. Mr. J. H. Gurney, jun., describes a colony of about five hundred birds in the Faioum, which had their nests in a large bed of dead tamarisks, about two to five feet above the water. At the time of his visit—June—none of the nests contained young, and many were in course of building. The eggs were usually three in number, but in one nest there were seven ('Rambles of a Naturalist' p. 210). Their colour is a very pale blue—almost white—the average measurements being 1·8 by 1·3 in.

The food of this species appears to consist of ticks (*Acari*) obtained, as already stated, from the cattle; beetles and other insects which are turned up by the plough; frogs, grasshoppers, and locusts. The note of the bird is likened by Heuglin to the syllable *grah*.

In the adult in summer, the head, occiput, cheeks, neck, and breast are rufous-buff colour, the base of each feather being white, and the buff-coloured ends being formed of the loose filaments of the web; from the middle of the back depends another patch of feathers, the filaments of which are sufficiently elongated to reach beyond the ends of the closed wings; these feathers, as also those of the occiput, and others hanging from the bottom of the neck in front, are of a rufous-buff colour; all the rest of the plumage is white, a trifle creamy on the wing-coverts; the lore and irides golden-pink; the beak reddish at the base, yellow at the tip; legs yellowish-red. Length about twenty inches. Wing, from the carpal joint to the tip, nine and a half inches. Tarsus three inches.

Males and females are alike in plumage, but the latter are rather smaller, and the plumes are less developed. In autumn and early winter the rufous plumes are absent.

The young specimen obtained by Montagu is thus described:—" The length is about twenty inches; the bill two inches long to the feathers on the forehead, and of an orange-yellow; the lore and orbits the same; irides pale yellow. The whole plumage is snowy white, except the crown of the head and the upper part of the neck before, which are buff: legs three inches and a half long, and one inch and a half bare space above the joint; these parts are nearly black, with a tinge of green; the toes and claws are of the same colour; the middle claw pectinated. The skin is of a very dark colour, almost black, so that on the cheeks and sides of the neck, where the feathers are thin, it is partly seen, or at least gives a dingy shade to the white plumage of those parts. On the back of the head the feathers are a trifle elongated, but scarcely to be called a crest; on the lower part of the neck before, the feathers are more elongated, and, though not slender, hang detached over the upper part of the breast: the tail when closed is in a slight degree forked, and so short as to be entirely covered by the wings when they are folded."



ARDEA RALLOIDES, Scopoli.*

THE SQUACCO HERON.

Ardea comata.

MORE than forty examples of this little Heron have now been taken in the British Islands. The earliest mention of it as a visitor is in the Minutes to the Transactions of the Linnean Society, iii., where it is recorded, under date of 4th April, 1797, that Mr. Lambert presented a drawing of a bird of this species shot at Boyton, in Wiltshire, in 1775. As might be expected from its distribution on the Continent, its visits have almost invariably been in spring and summer. It has been taken twice in Hampshire, and once in the Isle of Wight (May); three times in Dorset (May and July); once near Bridgewater, in Somersetshire; and twice in Devon: in July 1840, and in June 1878. In Cornwall, according to Rodd, about a dozen instances are known—all in spring—and most of the examples were in immature plumage. In Breconshire, one (May); in Cumberland, one (July); Shropshire claims one; Nottinghamshire, one (August); and Yorkshire, one. On the east coast, four examples have been obtained in Norfolk (May to July), and at least two in Suffolk; and one near Gainsborough, in Lincolnshire (June).

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* Annus I. Historico-Naturalis, p. 88 (1769).

In Scotland, an example was shot on the Glasgow Canal on the 9th October, 1852 ('Naturalist,' 1853, p. 61); and Mr. R. Gray exhibited a specimen in the collection of the Duke of Buccleuch, shot at Dalmahoy, in the parish of Ratho (Pr. Phys. Soc. Edinb. iv. p. 216). Six instances are on record of its visits to Ireland:—three in the counties of Cork and Waterford, and one each in Kerry and King's County; all between May and July; one, Londonderry, according to Mr. R. Lloyd Patterson, on the 23rd November, 1881: an unusually late date.

On the Continent the Squacco Heron is a spring and summer visitor which has only occurred as a rare straggler in Northern Germany, Denmark, Holland, Belgium, and the north of France, but it becomes tolerably common in the valley of the Loire, where there can be little doubt that it breeds. South of that line it is generally distributed in suitable localities throughout Central and Southern Europe from spring to autumn. In Spain it arrives in April, but in the valley of the Danube it is the beginning of May before it makes its appearance. It is known throughout the Mediterranean; and eastward its range extends to Palestine, Asia Minor, and the marshes of the Caspian; but it has not yet been traced beyond Persia. In the west it has occurred in the Canaries; and it breeds in considerable numbers in the marshes of Morocco, Algeria, and the rest of northern Africa, including Egypt; being to a great extent resident both there and in other parts of that vast Continent, as far south as Namaqua Land on the west and the Transvaal and Natal on the east. In Madagascar it was obtained by Mr. E. Newton.

The Squacco Heron breeds, as already stated, in colonies; its slight nest being built, according to Mr. Seebohm, on the same model as those of the Little Egret and Night-Heron, the twigs radiating from the centre. On the Danube the nests were in pollard willows; but on Lake Halloula, in Algeria, Canon Tristram found them on tufts of reeds, and composed of great heaps of water-weed and rushes. The Squacco is a very late breeder, and its eggs are seldom laid before the 10th of June; they are from four to six in number, of a greenish-blue colour, and average in measurements 1·5 by 1·1 in. In its breeding-haunts it is described as being very pugnacious towards other species.

The food of the Squacco Heron consists largely of water-beetles and various kinds of insects, small crabs, mollusks, frogs, minute fish, and occasionally small mammals, an entire shrew having been found in the crop of one examined by Mr. Rodd. Naumann says that this species affects the company of swine; but Colonel Irby remarked that in Spain it did not frequent the grazing-grounds of cattle after the manner of the Buff-backed Heron. It is a very silent bird, but occasionally utters a harsh *karr*. In its habits it is somewhat inactive, passing the greater portion of the day in one position, the head being drawn in between the shoulders like a Bittern.

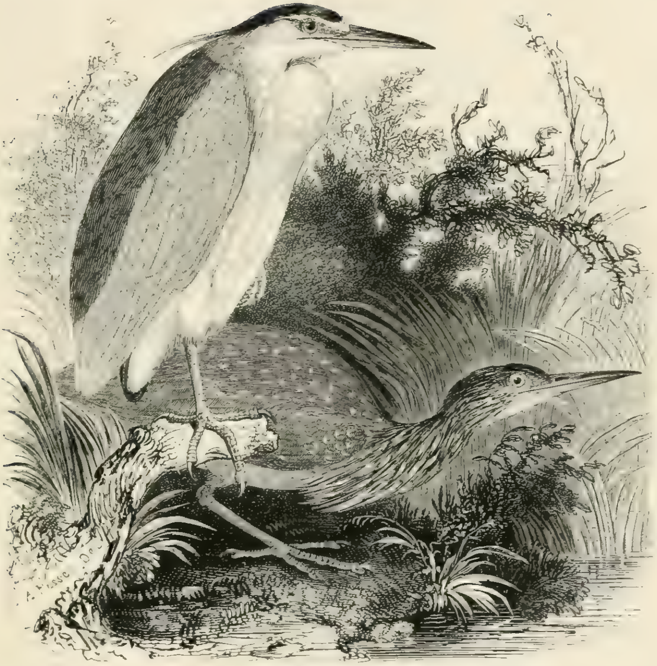
The adult bird has the beak cobalt-blue at the base, black towards the point; the lore naked and green; the irides yellow; the feathers on the top of the head pale yellow-brown, streaked longitudinally with dark lines, the feathers becoming elongated towards the occiput, with a dark line along each outer edge; the feathers forming the occipital plume are eight or nine in number, and from four to six inches in length, lanceolate, pointed, pure white along the centre, bounded on each side with a black line, with a very narrow terminal margin of white; the sides, front of the neck at the bottom, and the back, rich buff-colour; interscapulars reddish-brown; the feathers of the back elongated; the webs disunited, each filament having the appearance of a single hair, from which circumstance the term *comata*,—hairy—has been applied to it; the colour a pale reddish-brown in those upon the surface, passing into a delicate buff-colour in those underneath; the wings white, the ends of some of the coverts and tertials being tinged with buff; rump, upper tail-coverts, and tail-feathers, white; chin, throat, belly, under surface of the wings, the axillary plume, vent, and under-surface of the tail-feathers, pure white; legs yellowish-pink; toes yellow underneath; claws black. The breeding-plumage is sometimes not attained until late; birds shot by the Editor in Andalucia up to the 21st May being still very ragged about the neck.

The whole length, from the point of the beak to the end of the tail, is about nineteen inches; from the carpal joint to the end of the wing, nine inches.

The sexes resemble each other at the same age, but the plumes are more developed in the male.

In the immature plumage, which is the more frequently seen in this country, the descending dusky-grey streaks on the feathers of the neck are longer and broader, and the lighter ground-colour is mixed with ashy-brown; the wing-coverts are tinged with buff; the back, and the ends of the tertials, are wood-brown; and the younger the specimen, the darker are the feathers along the middle line of the back.

A nestling from Astrachan, belonging to Mr. E. Bidwell, is covered with down of a dull buff-colour on the upper parts, and of a dirty white below.



Nycticorax griseus (Linnæus*).

THE NIGHT-HERON.

Nycticorax Gardeni.

Nycticorax, *Stephens*†.—Beak about the same length as the head, bulky, strong, broad, and dilated at the base; upper mandible slightly bending and curved at the point; under mandible straight. Nostrils, longitudinal, lateral, but little in advance of the base of the beak, naked, placed in a groove, and partly covered by a naked membrane; lore and orbits naked. Legs of moderate length, naked for a short distance above the tarsal joint; tarsus longer than the middle toe: its scutellæ hexagonal in front; the outer and middle toe united by a membrane; claws short; that of the middle toe pectinated. Tail of twelve broad and moderately hard feathers

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[*] *Ardea grisea*, Linnæus, Syst. Nat. Ed. 12, i. p. 239 (1766).

[†] Shaw's General Zoology, xi. p. 608 (1819).

According to Latham (Synopsis, iii. p. 53), the first specimen of the Night-Heron recorded in England, was shot near London in May, 1782, since which more than sixty examples have been obtained in the British Islands. The species may, in fact, be considered as an almost annual visitor to our shores in spring and autumn, and in the south-western counties it has sometimes occurred under circumstances which invite the belief that, if unmolested, the birds would have bred with us. Thus Mr. C. J. Bulteel records in 'The Zoologist' (p. 2528), the discovery of four Night-Herons near Ermebridge, in Devonshire, on the 23rd May, 1849, all of which he succeeded in bagging; about a week later, from information he received, he renewed his search, and killed two more; and on the 22nd June two more were secured, making a complement of eight adult birds, four males and four females. Mr. Rodd mentions that in the second week of May, 1869, a pair of Night-Herons in adult plumage was secured near Hayle, in Cornwall, the ovary of the female containing eggs the size of a small bean; and from information supplied to the Editor by the Rev. M. A. Mathew, it seems probable that a brood was actually hatched out that year near New Bridge on the Taw, in North Devon. Several other examples have been obtained in Cornwall and Devon; also in Dorsetshire, Hampshire, Sussex, and the southern counties generally. In the eastern counties about a score of examples have been recorded: the last at Ranworth, Norfolk, in July 1880; in Yorkshire only four or five; in Durham and Northumberland still fewer; and to the western side of the island its visits have been few and far between. It has also been obtained from time to time in many of our inland counties, such as Oxfordshire, Berks, Bucks, Northamptonshire, Nottinghamshire, &c. In Scotland three captures are recorded by Jardine, to which have since been added three more—all in the south; and one, in immature plumage, shot near Aberdeen on the 9th January, 1866. In Ireland examples have been obtained in Donegal, Armagh, Louth, Kilkenny, Queen's County, and Cork.

The Night-Heron has been known to visit the Færoes, South Sweden, and Denmark; but even on the southern shores of the Baltic it is of rare occurrence. Of late years it has gradually receded from its breeding-places in the northern districts of Germany and Holland; and in the greater part of France it is principally known on migration, although it breeds sparingly in the south. In the Spanish Peninsula it nests in suitable localities, as well as in the marshes of Italy. In the island of Sardinia it is resident throughout the year; and it visits the entire coast and islands of the Mediterranean on passage. It breeds in considerable numbers in the valley of the Danube; and eastwards it ranges throughout temperate Asia as far as Japan; being resident in India, Burmah, and China; and occurring in the Philippines and the islands of the Eastern Archipelago. Its distribution extends over the whole of Africa and the neighbouring islands. The bird may in fact be described as cosmopolitan; for in America, from the Fur Countries down to Chili and the Falkland Islands—including most of the West Indian Islands and Bermuda—is found a form which offers no differences in plumage, but which is on the average slightly larger in size; and in South America the latter developes into a darker race, known by the name of *N. obscurus.* Both forms occur in the Sandwich Islands. In the Malayo-Australian region our bird is represented by *N. caledonicus*, which has the mantle, scapulars, wings, and tail fine cinnamon-colour.

The nests of the Night-Heron are generally placed in bushes or pollards, in the neighbourhood of swamps; but in places where the birds are protected, they select groves of trees, as, for instance, round the great Honam Temple at Canton, where the birds are held sacred. Swinhoe describes the nests as placed thickly in some venerable banyans; the granite slabs that form the pavement beneath the trees being bedaubed with the droppings of old and young, while from the nests arose the chattering cry of the callow broods, for which the parent birds were catering the whole day long, becoming more active at sunset. As darkness set in the noise and hubbub from the trees rose to a fearful pitch

(Ibis, 1861, p. 53). In some parts the Night-Heron makes its nest on the reeds, and in the swamps of Lake Michigan Mr. Nelson found over fifty nests placed in the midst of particularly dense bunches of wild rice, the stiff last year's stalks of which, converging near the roots, formed a convenient base for their support. The nests were all well-built structures composed of pieces of dead rice-stalks; their diameter was from twelve to fifteen inches, and a man could stand on them without doing them any perceptible injury. The eggs, from three to five in number, are of a pale greenish-blue, measuring about 2 by 1·4 in. Judging from Swinhoe's experience, the bird commences sitting on the first egg laid, and there is an interval of two days between each egg. In Europe incubation takes place in May.

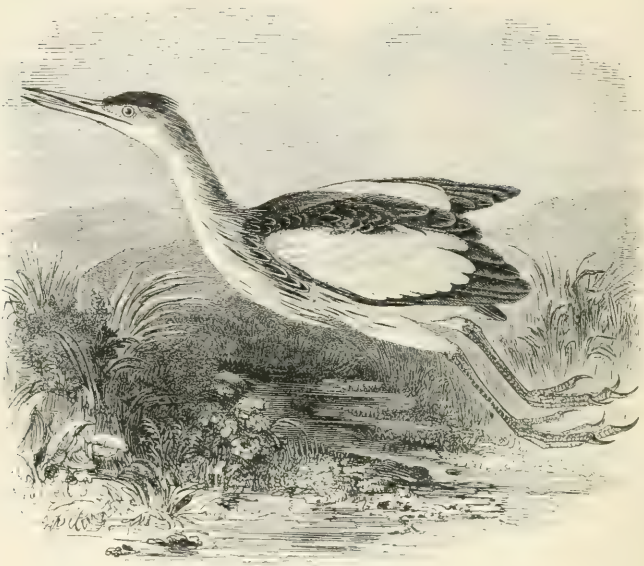
The food of the Night-Heron consists of water-insects and their larvæ, worms, snails, small fish, and frogs. The note of the bird is a mournful *qua-a*, seldom uttered except as a call-note in the dusk, or when its breeding colonies are disturbed.

The adult Night-Heron has the beak nearly black above and at the point; the base of the lower mandible and the naked skin around the eyes, bluish-grey; the irides crimson; the top of the head and the back of the neck black; the elongated occipital plumes white, and generally three in number, but in very old birds the number is greater, and as many as ten have been counted by Mr. Rodd and others; scapulars, interscapulars, and back, nearly black, glossed with green; wings, wing-coverts, all the quill-feathers, secondaries, tertials, and tail-feathers, ash-grey; throat and neck almost white, passing into dull greyish-white on the sides; breast, belly, thighs, flanks, and under tail-coverts, nearly pure white; legs and toes yellow; claws black. The female is slightly duller in plumage than the male. Length, from the point of the beak to the end of the tail, about twenty-three inches; from the carpal joint to the end of the wing, twelve inches.

The young Night-Heron has the upper mandible of the beak of a dark brown, the edge on each side lighter in colour, and, like the under mandible and the naked skin around the eye, of a pale greenish-brown; irides brown; no elongated occipital plumes; top of the head, back of the neck, interscapulars, shoulders, wing, and wing-coverts, clove-brown, the centre of each feather being pale wood-brown, extending to the tip, but bounded on the sides with darker brown; primaries, secondaries, and tertials, clove-brown tipped with pale wood-brown; rump, and upper tail-coverts, a mixture of ash-grey, pale brown, and clove-brown; tail-feathers greyish-brown; chin, throat, neck in front, breast, and under surface of the body, dull white, with elongated patches of greyish-brown; legs and toes brown, tinged with green; claws dark brown.

It appears from the statements of Swinhoe and A. Anderson, that males are capable of reproduction when still in immature plumage.

The nestling has the bare skin of a sea-green; the down is purplish-grey, tipped with white on the crown, and whiter on the flanks and belly; lore and bill yellowish-green; legs greenish above, yellow below.



ARDETTA MINUTA (Linnæus*).

THE LITTLE BITTERN.

Botaurus minutus.

ARDETTA, *G. R. Gray*†.—Beak longer than the head, slender, pointed, gape-line straight; nostrils, basal, linear, longitudinal; space in front of the eye bare. Legs rather short; the tibia feathered nearly to the joint; tarsus anteriorly scutellate; toes moderately long, slender, the middle toe shorter than the tarsus, and its claw pectinated on the inner edge. Wing broad, rather rounded; the second quill-feather barely longer than the first, and a little longer than the third. Tail short and rounded, consisting of ten soft feathers.

THE LITTLE BITTERN is the smallest British example of the family to which it belongs. It will be perceived that it differs from the true Herons in having little bare space above the tarsal joint, and its toes are also much longer. It appears

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[*] *Ardea minuta*, Linnæus, Syst. Nat. Ed. 12, i. p. 240 (1766).

[†] List of Genera of Birds, Appendix, p. 13 (1842).

to occupy a somewhat intermediate position between the Herons and the Bitterns, but its affinities are closer to the latter, inasmuch as the tail consists of only ten soft feathers, and it has only two pairs of powder-down tracts; whereas the true Herons have three pairs of the latter, and twelve tail-feathers. For it, and for four or five allied species, the genus *Ardetta* has been instituted; and although the structural distinctions between it and the true Bitterns may not appear very marked, yet the colour of the eggs of all the Little Bitterns is quite different from that in which prevails the genus *Botaurus*, and, so far as is known at present, the adult males of the Little Bittern group have a plumage distinct from that of the females and young.

In this country the Little Bittern may be considered rather as a summer visitor, most of the recorded examples having been obtained between spring and autumn. The Rev. Richard Lubbock, however, sent the Author word that the specimen mentioned by Mr. Paget, in his Sketch of the Natural History of Yarmouth, page 7, as in the collection of Mrs. J. Baker, was in immature plumage, and having been caught by a water-dog at Hickling, near Ludlam, during the extreme frost of 1822-3, was given by himself to Mrs. Baker's brother, the late Mr. Girdlestone. Messrs. Sheppard and Whitear also speak of one killed in the winter of 1819 near Burlingham; Mr. W. E. Clarke, out of thirteen occurrences in Yorkshire, gives winter dates for two; and there are other instances of a similar nature.

Some birds, if not prevented, would probably have bred in this country. Montagu, in his Supplement, says, "A female of this rare species was shot contiguous to the river Credy, in Devonshire, in the month of May, 1808. It was only wounded in the wing, and was kept alive for two days; and it was observed to sit with its neck contracted like the Common Heron, but with the bill pointing upwards. Upon dissection, about forty eggs were counted in the ovaries, some of which were so considerably enlarged as to induce an opinion that a brood would have been produced in this country, especially as a male was afterwards shot not very distant, and had previously been seen near the same place. A third was also killed in the same neighbourhood during that summer."

Early in September, 1839, the late Mr. Heysham sent the Author word that about two months previous to the date of his letter a beautiful pair of adult Little Bitterns were shot at or near South Walsham, where it was supposed they had a nest; and Mr. Stevenson states that in one instance a perfect egg was taken from a female shot near Lowestoft. In a foot-note to a recent edition (1879) of Lubbock's 'Fauna of Norfolk' (p. 90), Mr. Thomas Southwell says that Mr. Rising, of Horsey, assured him that about the year 1822-3 a nest of the Little Bittern was found at Catfield, close to the parsonage, and Mr. Rising saw the eggs in the possession of the Rev. J. Layton.

In the summer of 1826 a young specimen of the Little Bittern was shot on the banks of the Thames, near Windsor; and it was believed to have been bred there, from the situation being favourable, and the circumstance of a second bird in the same state of plumage being seen about the same spot for several days at that time.

So many examples of the Little Bittern have now been taken in various parts of this country, that only a brief enumeration will be necessary. Montagu mentions that one was shot from the stump of a tree on the bank of the Avon, near Bath; the late H. E. Strickland sent the Author notice of one that was shot in the spring of 1838, at Shobden Court, in Herefordshire; this species has also been killed in Shropshire, South Wales, Cornwall, Devonshire, Somersetshire, Dorsetshire, Hampshire, Sussex, Kent, Oxfordshire, and Berkshire; a specimen in the Author's collection was killed on Uxbridge Moor, and another was shot at Enfield in Middlesex; and it has occurred in Essex. In Norfolk about fifteen have been obtained: most of them on Hickling and South Walsham 'broads'; and several in Suffolk. The figure at the head of this subject was drawn from a very fine specimen in the collection of the late Dr. Thackeray, at King's College, Cambridge; several have been taken in

Lincolnshire; thirteen in Yorkshire; one at the mouth of the Tyne: and from another killed in Northumberland and belonging to the late Sir M. W. Ridley, Bart., Bewick's figure of the adult Little Bittern was taken. Although rarer on the western side of our island, Lancashire and other counties can show records, and there is probably not a county in England in which it has not been observed.

In Scotland the occurrences of the Little Bittern have been few, and at long intervals; but it has been known to straggle to the Orkneys, and once to Shetland. To Ireland it was considered by Thompson to be a very rare visitant, but Sir R. Payne-Gallwey says that it is not very unfrequent; and there are records of its occurrence in various parts of the island.

The Little Bittern has been known to straggle to Iceland, the Færoes, Norway, and Sweden; and it has been obtained on several occasions in Denmark, but its usual migrations do not extend beyond the Baltic. South of that line it is found in summer throughout Europe wherever the localities are suited to its habits; but even from Spain, Italy, and other southern countries, it takes its departure in autumn, returning in April. Westward its range extends to Madeira and the Azores. In Asia our Little Bittern is found from the Caspian to Cashmere—where it breeds—Nepal, and the north-west of India; but to the eastward it is replaced by an allied species, *Ardetta sinensis*, in which the back is brown instead of black. Our bird is distributed over the greater part of North Africa, and migrates in some numbers as far south as the Transvaal, but the representative species of South Africa is *A. podiceps*. In America there is a still smaller species, *A. exilis*.

The Little Bittern inhabits marshes by the sides of rivers, plantations of osiers, and other moist situations in which reeds and aquatic herbage grow luxuriantly; and in these it skulks during the greater part of the day, becoming more lively towards the evening. Its food is the fry of fish, frogs, and other small reptiles, mollusks, and insects. The note of the male is described by the Rev. T. Frere as "resembling the bark of a dog, or more nearly the grunt a paviour gives when dropping his rammer" (Zool. p. 2498). The female, when disturbed from her nest, utters a sound like *gett, gett*. The nest is a solid structure of flag-leaves and bits of grass, attached to upright growing reeds, very little above the water; and sometimes, according to Gloger, a deserted Magpie's nest in some low bush near a swamp is utilized. The eggs are usually four or five in number, but nine are said to have been found; they are of a uniform dull white, averaging in measurements 1·4 by 1 in. Incubation is said to last sixteen or seventeen days.

In the adult male, the beak, lore, and irides are yellow; the top of the head, occiput, shoulders, wing-primaries, and tail-feathers, are of a shining greenish-black; all the wing-coverts buff-coloured; the cheeks and sides of the neck, throughout its whole length, buff; the back of the neck almost bare, as in the true Bitterns, but the feathers of the sides of the neck passing obliquely backwards and downwards hide the almost naked space; the chin and the neck in front white, partially tinged with buff; the feathers at the bottom of the neck in front are elongated, but there is no true occipital plume, or elongated feathers, on the back, as in the Herons; on the lower part of the neck on each side, just in advance of the carpal joint of the wing, when the wing is closed, a few of the feathers have dark centres with buff-coloured margins; breast, belly, thighs, and under tail-coverts, buff, with a small patch of white about the vent; under wing-coverts and the axillary plume pale buff; the legs, toes, and claws, greenish-yellow.

The adult female differs from the male in having a brown tinge on the black feathers of the occiput; the side of the head and the back of the neck are rufous; the feathers of the throat and front neck have brown shaft-streaks and buff edges; the wing-coverts are brownish-buff; the back dark brown, margined with buff; and the breast and flanks are much streaked with brown.*

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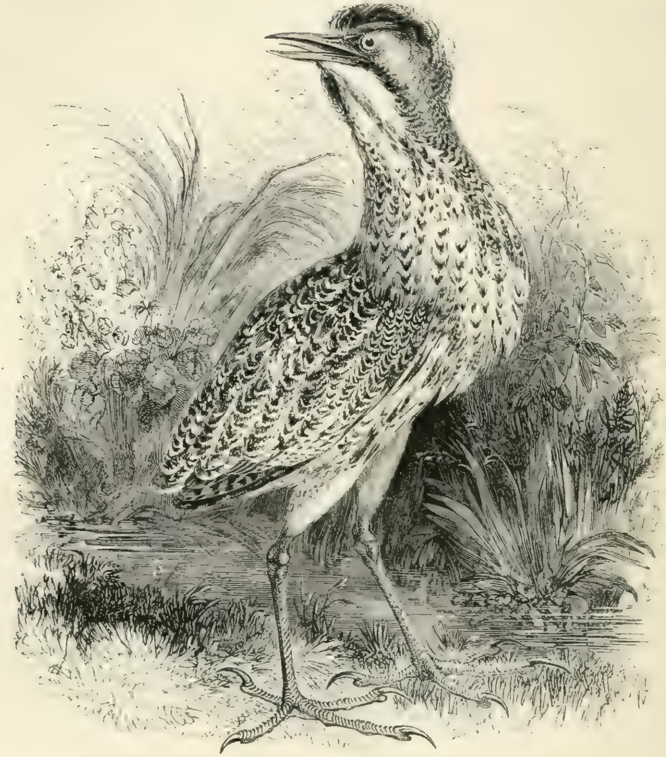
* In former Editions it was stated that "males and females, when adult, are alike in plumage" [ED.].

The whole length of the male is about thirteen inches. From the carpal joint to the end of the wing, five inches and three-quarters. The female is a trifle smaller.

A young bird in its first plumage, and with some down still remaining upon it,—in which state it has been obtained on the banks of the Lea River, near Enfield,—has the top of the head of dark brown; the feathers of the neck white at the base, pale yellow-brown towards the end, with a streak of dark brown in the line of the shaft; the feathers of the back dark brown, with buff-coloured edges; the wing-primaries and tail-feathers greyish-black; the outer web of the first quill-feather chestnut; the carpal surface of the wing and the tertials reddish-brown; the wing-coverts buff; breast pale buff, with long streaks of dusky-brown in the line of the feather; thighs in front pale buff, without streaks, but varied with brown streaks behind; vent, under tail-coverts, and under wing-coverts, pale buffy-white; legs, toes, and claws, reddish-brown. The dark-coloured streaks on the neck and breast, and the broad light-coloured margins of the feathers on the upper surface of the body, are lost by degrees.

A nestling in the collection of Mr. E. Bidwell is covered with a soft ochreous-yellow down, longer on the back.

HERODIONES. *ARDEIDÆ.*



Botaurus stellaris (Linnæus[*]).

THE COMMON BITTERN.

Botaurus stellaris.

Botaurus, *Stephens*[†].—Beak rather longer than the head, strong, higher than broad, the mandibles of equal length, upper mandible curved downwards. Nostrils basal, linear, longitudinal, lodged in a furrow, and partly covered by a naked membrane. Legs of mean length, tarsi scutellate ; toes long, and slender, all unequal, the middle toe as long as the tarsus ; hind toe long, articulated with the interior toe, and on the same plane : claws long, that of the middle toe pectinated. Wing long, rather rounded, the first three quill-feathers the longest, and nearly equal. Tail of ten soft feathers.

[*] *Ardea stellaris*, Linnæus, Syst. Nat. Ed. 12, i. p. 239 (1766).

[†] Shaw's General Zoology, xi. p. 592 (1819).

Formerly, when large portions of the British Islands were uncultivated, and extensive marshes and waste land afforded the Bittern abundance of retreats congenial to its habits, it was plentifully distributed over the country; but as cultivation has extended, and the marshes have been drained, its numbers have gradually decreased, and although not absolutely a rare bird, its presence is not always to be reckoned upon, for in one year it may be tolerably common, and then for several succeeding seasons scarcely to be procured at all. In proof of the correctness of these remarks, Selby observes that at the present day the capture of a Bittern is, in many parts of England, a subject of great interest; yet in the winter of 1830-31, he was credibly informed that no less than ten were exposed for sale in one morning at Bath. In the same season, according to Mr. W. E. Clarke, about sixty examples were obtained in Yorkshire; and Heysham, of Carlisle, has recorded that during the months of December, 1831, and January and February, 1832, eight specimens of the Bittern were killed in that part of Cumberland; which was the more remarkable, as only a single specimen had been met with in the same district for ten or twelve years previous. Thompson says that in the winter of 1830-31 Bitterns were unusually numerous in Ireland. Allis, of York, sent the Author word that in the winter of 1837 a bird-preserver in Bath had a dozen Bitterns through his hands in a comparatively short space of time. In subsequent years similar arrivals have been noted; and it may be taken as a rule that severe weather on the Continent will be followed by the apparition of this species in some numbers. In the winters of 1863-4, 1867, and 1874-5 there were large immigrations. Of Lincolnshire Mr. Cordeaux writes to the Editor:—"I have talked to old men who have assured me they have frequently heard the 'butter-bumps' [a well-known onomatopoetic name for the Bittern], booming in the low grounds in this parish (Great Cotes) at the beginning of this century. Sir Charles H. T. Anderson wrote me (Jan. 4, 1875): 'A Bittern killed itself in Lea parish in 1814 flying against a tree in a fog;

and I have heard my mother say that, before she married, about the beginning of this century, she used to hear them booming in the warrens and swamps of Manton and Twigmoor in her afternoon rides from Scawby.' " As regards the other eastern counties, many particulars of great interest will be found in Mr. Stevenson's 'Birds of Norfolk.' The Bittern has, naturally, been found more abundantly in the districts best suited to its habits, but there is not a county in England in which it has not been obtained at one time or another.

Before the drainage of the fens the Bittern was an annual breeder with us, and even during the present century several instances are on record. Graves, in his 'British Ornithology,' mentions a nest on the Cam, in 1821, which contained four young birds and an addled egg. The Rev. W. B. Stonehouse, writing in 1839, says, in 'The History and Topography of the Isle of Axholme,' in Lincolnshire, "In 1817 I shot two Bitterns on Burringham Moor, opposite Daddythorpe, and on one occasion saw a nest containing four eggs." Eyton, in his 'Fauna of Shropshire,' says a hatch of these birds came off at Cosford Pool, near Nufnal, in 1836; and during the same summer, and in the same county, a pair of Bitterns bred at Tonglake, Albrighton, in a reedy pond of half an acre, surrounded by bushes, about half a mile from the Holyhead road; two young birds, about half grown, were caught by a farmer's boy. In 1849 or 1850, a nest containing four eggs was found at the Reservoirs, near Tring, in Hertfordshire; and Capt. A. W. M. Clark-Kennedy states on the authority of the Rev. Harper Crewe that a nest and eggs were taken by Mr. Williams, of Tring Park, and the female shot, near Drayton Beauchamp, in Buckinghamshire (Zool. s.s. p. 1255).* Messrs. Sheppard and Whitear, in their 'Catalogue of Norfolk and Suffolk Birds,' state that they had once obtained an egg of this bird in the marshes of Norfolk; Lubbock, in his 'Fauna of Norfolk,' mentions several instances of the young of the

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* It is not improbable that these records relate to the same occurrence, as Drayton Beauchamp is close to Tring.

Bittern taken in that county; and Mr. W. R. Fisher gave the Author a drawing of one taken, with an addled egg, at Ranworth, by Mr. D. B. Preston, and figured in 'The Zoologist' (p. 1321). An egg in the collection of Prof. Newton was taken at Horsey in 1841; an unfledged bird was picked up alive in the marshes near Yarmouth about 1845, and lived in captivity till the winter of 1847; and Mr. Gurney has three nestlings, taken at Surlingham or Ranworth in 1847 or 1848. The latest recorded instance is of a nest found on a small broad at Upton, on the 30th of March, 1868, containing two eggs, now in the possession of Mr. H. M. Upcher, of Feltwell; and on the 25th of May of that year a young bird was caught alive in the same locality. Considering that out of 108 specimens stated by Mr. Stevenson to have been brought into Norwich in the course of eighteen years, fifteen were obtained in February, ten in March, and one in April, there can be no doubt that if unmolested the 'boom' of the Bittern might again be heard in our land during the breeding-season.

In Scotland, according to Mr. R. Gray, the Bittern is not a common species anywhere, but he has seen examples from almost every county; and it occasionally straggles to the Outer Hebrides, the Orkneys, and the Shetlands. In Ireland it used to breed until the first quarter of this century in the marshes at the confluence of the Blackwater and Bride, in co. Waterford; but now it is principally an irregular winter visitant.

According to Reinhardt, the Bittern has once occurred as a straggler in Greenland. It is a summer visitor to Sweden up to about 60° N. lat., and its range can be traced through Northern Russia to latitudes varying from 57° to 64°: the latter on the Yenesei. Southwards its summer distribution extends throughout the entire Palæarctic region from the Azores to China and Japan. In the warmer parts of Europe it is resident; its numbers being augmented in winter by migrants from the north. It breeds in Persia and in Northern and Central India, and has occurred in Burmah; but Colonel Legge does not mention it among the birds of Ceylon. It appears to be found in suitable localities throughout Africa, and Mr. E. L. Layard had the eggs brought to him at Zoetendals Vley in Cape Colony, where he found the bird in great abundance.

The Bittern is an early breeder, and eggs may be looked for in March and April. Extensive reed beds, such as still remain, in spite of drainage, in Holland and other parts of Europe, are the usual nurseries of this skulking species; but sometimes it selects the swamps on the margins of unfrequented lakes. The nest is placed on the ground, amongst the thickest herbage, and is composed of dried flags and reeds heaped together. The eggs, usually four in number, are of a uniform brownish-olive colour, sometimes of a greenish shade when fresh; average measurements 2·1 by 1·5 in. They are probably laid at intervals of several days, for Lubbock states that in two instances the finders of nests assured him that of four young in each, two were much older than the others; and the Editor remarked considerable differences in the degrees of incubation, in two clutches which were brought to him. The young are produced in about twenty-five days; they are fed by the parents until fully fledged, and do not quit the nest till they are nearly able to provide for themselves.

The Bittern usually feeds at night, and is therefore seldom seen on wing in the day, but remains with head erect in thick beds of reeds, or conceals itself among flags, rushes, or other rank aquatic vegetation, which afford it a solitary and secure retreat. From such situations it is with difficulty made to take flight, and when at length obliged to get on wing, the pace is dull and flagging, and seldom sustained to any great distance. Vieillot says, that in France it is occasionally found in woods, and in Spain the Editor has seen one taking its rest during the heat of the day on a pine-tree. In the spring, and during the breeding-season, the male Bittern makes a loud booming or bellowing noise, whence, probably, the generic term *Botaurus* was selected for it; but when roused at other times, the bird is said to utter a sharp, harsh cry on rising, not unlike that of a Wild Goose.

The Rev. W. B. Stonehouse, already quoted, says, "The Bittern always changes its haunts in the dusk of the evening, and then, rising in a spiral direction, soars to a vast height. It flies in the same heavy manner as a Heron, and might be mistaken for that bird, were it not for the singularly resounding cry which it utters from time to time while on the wing; but this cry is feeble when compared to the hollow booming noise which it makes during the night time, in the breeding-season, from its swampy retreats." When on the ground wounded, the Bittern will strike at dog or man; and some care is necessary, when about to handle one, to avoid a blow from the point of its sharp beak. If a dog advances upon one that is not entirely disabled, the bird throws itself on its back, like a Hawk, and fights with its claws as well as with its bill; and, owing to the length to which the drawn-in neck can suddenly be extended, approach is often attended with danger to the incautious.

In 'The Zoologist' for 1883 (p. 223) Capt. H. R. Kelham gives the following description of a migration of this species:—"On December 15th last, when steaming from Alexandria to Cairo about sunset, a flock of forty or fifty large birds appeared slowly flapping towards us. When a long way off I at first mistook them for Lapwings, but as they passed close over us I saw they were Bitterns, the common *Botaurus stellaris*. I never before saw so many together, but there was no doubt whatever about the species. They flew in a V formation, but every now and then got into great confusion, as if they had suddenly been fired at."

In the choice of its food the Bittern is not very particular, feeding on small mammals, birds, fishes, lizards, and frogs: in fact anything which can be swallowed whole. In the stomach of one examined in January, 1826, the Author found the bones of a pike of considerable size, and the stomach of another examined in February, 1820, contained a Water Rail whole, and six small fishes. In the stomachs of two examined by Mr. Blyth, two dace, the remains of other fish, and some large coleopterous insects, were found.

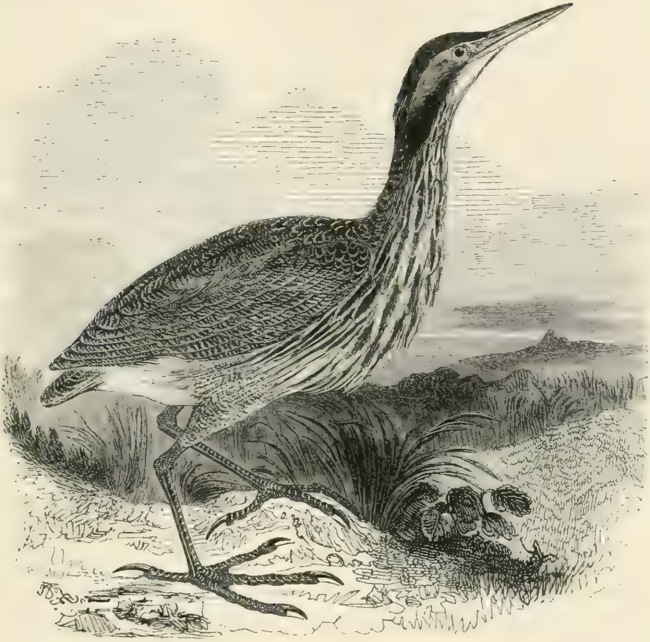
The Bittern was formerly in some estimation as an article of food for the table: the flesh is said to resemble that of the Leveret in colour and taste, with some of the flavour of wild-fowl. Sir Thomas Browne says that young Bitterns were considered a better dish than young Herons.

The beak is greenish-yellow, the upper mandible varied with dark horn-colour towards the point; the lore green; the irides yellow; the top of the head black, tinged with bronze-green; the occipital feathers varied with transverse bars of black and pale buff; all the upper surface of the body pale brownish-buff, irregularly marked with black and dark reddish-brown; the primary quill-feathers mottled with greyish-black and chestnut-colour; tail-feathers reddish-brown, varied with black; the cheeks buff; the sides of the neck the same, but with narrow transverse lines of dark brown; chin pale buffy-white; from the angles of the mouth, and down the neck in front, are large longitudinal streaks of dark brown and reddish-brown; the feathers of the breast blackish-brown in the centre with broad margins of buff; under surface of the body buff, with narrow streaks of dark brown; legs and feet grass-green; claws pale horn-colour, the middle claw pectinated.

The specimen from which the representation of the Bittern here given was taken was killed some years ago in Denny Bog, in the New Forest, and the bird was sent to the Author by his friend, Major Gilbert, of Bartley, near Lyndhurst.

The whole length of an adult bird is from twenty-eight to thirty inches. From the carpal joint to the end of the wing, fourteen inches; the first three quill-feathers nearly equal in length, and the longest in the wing. Neither the females nor the young of the year differ essentially from the males in their plumage.

The nestling is covered with a rust-coloured hair-like down on the upper parts; the throat and abdomen dull white.



Botaurus lentiginosus (Montagu*).

THE AMERICAN BITTERN.

Botaurus lentiginosus.

The American Bittern is an accidental visitor which has occurred more than twenty times in the British Islands. The first instance on record is that of the bird shot by Mr. Cunningham, on the banks of the Froome, in the parish of Piddletown, Dorsetshire, in the autumn of 1804. The flight was said to be rather rapid, and the bird made a noise something like the tap on a drum, which induced him to believe it was the Common Bittern, and as such he sent it to Colonel George, of Penryn, in Cornwall, who was at that time making a collection of birds. The specimen was quite fresh when it arrived at Penryn, where it was preserved; but the sex was not noted. When Colonel George disposed of his collection, this bird was bought for Montagu, and was afterwards, with his other birds, transferred to the British Museum, where it is still preserved. Montagu distinguished it as a new species, naming it *Ardea lentiginosa*, 'The Freckled Heron,' and as such it is figured in the Supplement to his Ornithological Dictionary (1813). The following year the species received the name of *Ardea minor* from Alexander Wilson.

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* *Ardea lentiginosa*, Montagu, Suppl. Orn. Dict. (1813).

In Devonshire, a specimen which no longer exists, but which was recorded as "exactly corresponding with Montagu's description," was in the collection of the late Dr. Moore, and was obtained near Plymouth on the 22nd December, 1829; and in October, 1876, one was shot near Parracombe, North Devon (Zool. s.s. p. 4720). A bird was shot in Hampshire in February, 1876 ('The Field,' 10th March, 1877). In Sussex, one, obtained in Pevensey Marshes, on the 26th November, 1867 (Zool. s.s. p. 1098), is now in the collection of Sir John Crewe; and one killed at Amberley on the 30th November, 1883, is in the collection of Mr. W. Borrer (Zool. 1884, p. 68). As regards Kent, one killed near Canterbury, about 1854, has been identified by Mr. J. H. Gurney (Zool. s.s. p. 145). On the eastern side of England one shot at Slingsby, near Malton, on the 4th December, 1871, is in the collection of Sir John Crewe (Clarke, Yorks. Vertebs. p. 51); and one was killed near Northallerton, on the 27th October, 1882 (Zool. 1884, p. 177). On the west side, one, examined in the flesh by Mr. Gurney, was secured in Anglesea in 1851 (Zool. s.s. p. 145); and one, identified by Mr. Cecil Smith, was killed in October, 1872, at St. David's, Pembrokeshire (Zool. 1883, p. 341). In Lancashire, a male, described by Mr. Cooper (Zool. p. 1245), was shot at Fleetwood, on the 8th December, 1845; and a bird believed to be of this species is recorded by Mr. J. R. Wallace, in the Isle of Man.

In Scotland, an American Bittern was obtained by the late Sir William Jardine towards the end of October, 1844, in Dumfriesshire; and in the same county another, now in the collection of Mr. J. H. Gurney, jun., on the 25th March, 1873 (Zool. s.s. p. 4929). Mr. R. Gray states that a female example, now in the Aberdeen University Museum, was shot near the Bridge of Don, in November 1854; and in the autumn of 1862 one was killed at Latheron-wheel, Caithness, by Mr. F. S. Bentley Innes. About the year 1861, one, in the collection of Mr. Charles Cowan, of Logan House, was shot in the Pentland Hills (Field, 4th March, 1871). In Islay one was obtained in January 1876 (Zool. s.s. p. 4801).

In Ireland, the first occurrence is that recorded by Thompson, near Armagh, on the 12th November, 1845, and this specimen is now in the Belfast Museum. A female shot on the river Fane, on the borders of Louth and Monaghan, on the 18th November, 1868, and sent to Lord Clermont in the flesh (Zool. s.s. p. 1517), is now in the Museum of Science and Art, Dublin. On the 1st November, 1883, a male was shot near Ballynahinch, co. Down ('The Field,' 10th Nov. 1883). One was obtained near Cahir, co. Tipperary, on the 31st October, 1870 (Zool. s.s. p. 2408); and Dr. Harvey states that one, shot near Kinsale, co. Cork, on the 25th November, 1875, is in his own collection, and one, obtained early in October of the same year, near Myross Wood, in the west of co. Cork, is in the collection of Mr. H. P. Townsend, of Derry, Ross Carberry ('The Field,' 18th December, 1875).

An American Bittern was shot in Guernsey on the 27th October, 1870, and recorded by Mr. Cecil Smith, in whose collection it now is; but up to the present time there is no authentic instance of the occurrence of this species on the Continent of Europe. The greater part of the trade across the North Atlantic is to the British Islands, which are the nearest land, and there can be little doubt that many of these immigrants have received assistance on their passage, by being able to repose on the spars of vessels, especially of steamers, where square-sails are less frequently employed, and a bird might easily remain unobserved and undisturbed by day as well as by night, while each twenty-four hours found it some 300 miles further on its way across. It could probably exist without food for far longer than such a passage would require.

This species is stated by Messrs. Baird, Brewer, and Ridgway, to have a distribution almost co-extensive with the Northern Continent itself. Richardson says, "It is a common bird in the marshes and willow thickets of the interior of the Fur-countries up to the 58th parallel. Its loud booming, exactly resembling that of the Common Bittern of Europe, may be heard every summer evening, and also frequently in the day. When disturbed it utters a hollow, croaking cry." The term *mokoho*, applied to this species by Vieillot, Wagler, and others, has reference, probably, to the name by which this bird is known among the Cree Indians. The specimen from which Edwards drew the representation given in his Gleanings, plate 136, came from Hudson's Bay. Mr. Bernard Ross states that its range on the Mackenzie River extends even to the Arctic Ocean, but the bird is probably rare so far north. It breeds, as a rule, wherever it is found, from the Fur-countries, Labrador, and Newfoundland, to Texas. It has various names in different States; such as Indian Pullet, Indian Hen, and Dunkadoo,—a word, says Wilson, probably imitative of its common note. It is an autumnal visitor to the Bermudas, in varying, but sometimes considerable, numbers; it has occurred in Cuba, Jamaica, and probably some other West Indian islands; and Mr. Salvin obtained it in Guatemala. Westwards, it is found in Vancouver's Island.

The nest of the American Bittern is a slight structure of reeds and grass when situated on dry ground, but in places where there is a liability to inundations it is sometimes considerably elevated. The eggs, usually four in number, but sometimes, according to Capt. Bendire, from five to seven, are equally obtuse at either end, and of a uniform brownish-drab colour: average measurements 1·9 by 1·45 in.

The usual food of this species consists of frogs, lizards, and small mammals; but as an instance of its omnivorous habits, Mr. Hurdis, of Bermuda, mentions that the stomach of one contained an eel six inches long, a mouse, a dragon-fly, a grasshopper, and a portion of a small golden carp. Wilson says that the bird, when fat, is considered by many to be excellent eating; and in the markets of New Orleans, Audubon tells us, it is bought in autumn by the poorer classes to make gombo soup; but Dr. Elliott Coues says that as an article of food the Bittern is not a success, although he has seen it brought to table several times under favourable culinary circumstances.

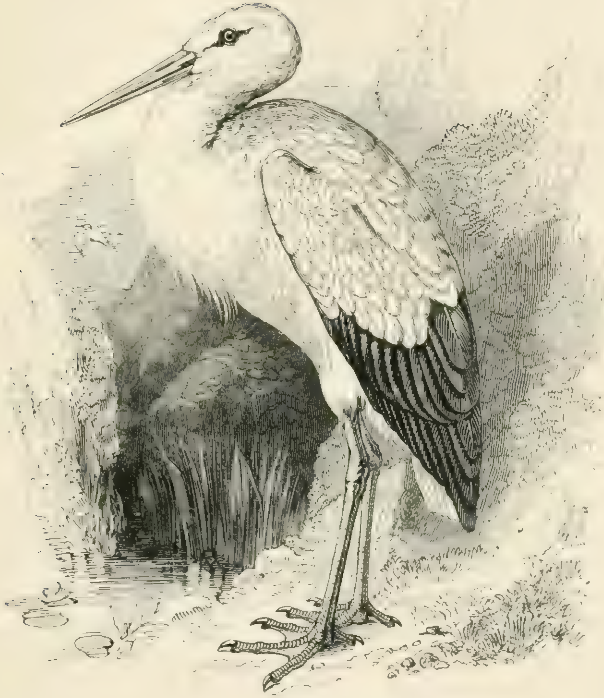
The note of the male in the early part of the breeding-season is a deep choking croak, resembling the syllables *pomp-au-gōr*, or like the noise made by driving a stake in boggy soil; whence its common name of "Stake-" or "Post-driver." Mr. Samuel likens it to *chunk-a-lunk chunk, quank chunk-a-lunk-chunk;* and says that he has often, when in the forests of Northern Maine, been deceived by this note into believing that some woodsman or settler was in the neighbourhood, and discovered the mistake only after toiling through swamp and morass for perhaps half a mile. Dr. Coues says that "besides this peculiar call-note, the bird has another, its ordinary cry, when its breast is not in the least swelling with the tender passion. This is a single, abrupt, explosive syllable, something like *quark* or *hauk*, delivered with a rough, guttural intonation. It is always uttered when the bird is surprised while feeding, or when its haunts are invaded. As it lives so much among reeds and rushes, very often the first intimation one has of its presence is the energetic utterance of this note, to be followed in an instant by the heavy form of the bird itself, as it tops the tall reeds. Ordinarily, however, the Bittern is decidedly a silent bird."

In the adult the beak is lemon-yellow; the upper mandible dark brown along the upper ridge, and at the point: the lore greenish-yellow; the irides yellow; crown of the head brown, tinged with red; from the forehead, before, over, and behind the eye, a streak of light yellow-brown; occiput and nape brown; all the back of the neck below the nape bare; interscapulars, back, scapulars, and wing-coverts, rich brown, the centre of each feather the darkest and most uniform in colour, the edges freckled with the darker brown on a ground of yellow-brown; the primaries uniform leaden-brown, slightly tinged with chestnut; the secondaries brownish-black, broadly tipped with chestnut and freckled with brownish-black; all the shafts black; tertials freckled dark brown, red-brown, and buff; upper tail-coverts buff, freckled with two shades of brown; tail-feathers almost uniform reddish-brown; chin and front of the neck a mixture of white, buff, and dark brown in streaks; ear-coverts, and a line descending therefrom, yellow-brown: between this and the throat in front an elongated descending streak of black; the loose elongated feathers of the front and sides of the neck down to the breast, are brown along the centre, bounded by a darker line, and with broad edges of pale buff: breast and belly buff, each feather with an elongated brown central patch; vent and under tail-coverts uniform buff; legs and toes greenish-yellow; the claws darker; the middle claw pectinated. As concisely stated by Mr. J. E. Harting, in his excellent 'Handbook of British Birds' (p. 151), the American Bittern may be distinguished from the Old World *Botaurus stellaris* by its smaller size, more slender legs and feet, and the uniform leaden-brown colour of the primaries, which in our species are broadly barred across both webs with buff.

The young are more reddish than the adults; and the mottling is coarser, with a tendency to form ragged transverse bars.

The whole length is about twenty-seven inches. From the carpal joint to the end of the wing, eleven inches and a half: the first three quill-feathers nearly equal in length, and the longest in the wing; the first quill-feather differs in form from the second and third, being remarkably pointed at the end, while the second and third are rounded.

The nestling is covered with a yellowish-buff down, much lighter than in the European Bittern.



Ciconia alba, Bechstein.*

THE WHITE STORK.

Ciconia alba.

Ciconia, *Brisson*†.—Beak longer than the head, straight, strong, and pointed. Nostrils pierced longitudinally in the horny substance. Eyes surrounded by a naked skin. Legs long; feet with four rather short toes; the three in front united by a membrane as far as the first joint; claws short, broad, obtuse; the middle one not pectinated. Wings rather large; the first quill-feather shorter than the second; the third and fourth quill-feathers the longest in the wing. Plumage without powder-down tracts. Tail short, and slightly rounded.

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* Naturgeschichte Deutschlands, iii. p. 48 (1793).

† Ornithologie, v. p. 361 (1760).

It does not appear that the White Stork has ever been more than an irregular visitor to the British Islands. So long ago as 1544 Dr. William Turner, writing at Cologne, expresses his surprise that a bird so common in Germany should be unknown in Britain, except in captivity. By Merrett, Willughby, and Ray, it was considered a very rare visitor to this country; but Sir Thomas Browne, writing at Norwich, says, "I have seen this bird in the fens, and some have been shot in the marshes between this and Yarmouth." Wallis, in his 'Natural History of Northumberland' (i. p. 336), mentions one which was killed near Chollerford Bridge, in the year 1766, and its skin being nailed up against the wall of the inn at that place, drew crowds of people from the adjacent parts to view it. During the present century, however, and probably in consequence of the increased attention given to birds, a good many occurrences have been recorded.

As might be expected, owing to the proximity of Holland, where the White Stork is a regular and protected visitor, this species has been more frequently observed in the eastern counties than in other parts of our island. Messrs. Gurney and Fisher point out that one or two of these birds are generally killed in Norfolk every year, usually during the spring months; and Mr. H. Stevenson has enumerated twenty-three occurrences. An adult female, shot about the 17th May, 1861, at Woodbastwick, contained an egg quite ready for exclusion, which was only slightly cracked on one side by the fall of the bird. Several examples have also been obtained or observed in Suffolk and Essex. Respecting Lincolnshire, Mr. Cordeaux writes to the Editor, that in an old map, MDCXXVI, of the Isle of Axholme, before the drainage by Vermuyden, 'Stork-carres' are marked between Haxey and Wroote, on the east bank of the river Idle (Idille); but it must be remembered that the term 'Stork' is not unfrequently applied to the Heron. In the Humber district Mr. Cordeaux has only recorded a single adult bird, shot near Withernsea in September 1869; and Mr. W. E. Clarke mentions seven other occurrences in various parts of

Yorkshire. In Nottinghamshire two have been killed on the Trent. Mr. J. Hancock states that he observed one over Prestwick Car, in Northumberland, in May 1866; and one was shot at Scremerston on the 10th June, 1874. Northwards the visits of this species become rarer; the records comprising one in Berwickshire in 1848; one in Forfarshire in 1835; one in Aberdeenshire in the winter of 1837-38; one on South Ronaldshay, Orkney, in 1840; and two in the Shetlands. In the south, the late Dr. Moore, on the authority of Mr. Gosling, says, that three birds have been obtained in Devonshire; and Mr. Rodd mentions an adult killed in May 1848, in the Land's End district, in Cornwall. One was killed in Hampshire in 1808 by the gamekeeper of John Guitton, Esq., of Little Park, near Wickham; and Mr. E. Hart informs the Editor that he has one shot in Poole Harbour in July 1881. One has been killed near Salisbury; and one, out of a flock of four, was shot in Oxfordshire; but with regard to a bird shot at the end of July 1883, in Hertfordshire, there is a suspicion that it had escaped from Mr. H. D. Astley, of Chequers Court, Tring; and this observation applies, in a less degree, to a young bird shot in September 1882, in Kent (*cf.* Zool. 1884, p. 195). Several have, however, been previously killed in Kent; and one so recently as the end of August 1884, at Pevensey, in Sussex. Mr. R. A. Valpy, writing to 'The Field' under date of 3rd of May, 1884, says, "On Wednesday evening, the 23rd ult., about a quarter to seven, while standing on the new railway, about three miles from the town of Newbury, we were surprised to see a flock of six White Storks (*Ciconia alba*) pass close to us, flying in a north-easterly direction. When first observed they were flying directly towards us, about thirty yards from the ground"; and on May 17th Mr. W. F. Hall writes: "With reference to Mr. R. A. Valpy's letter on this subject, I beg to state I also witnessed the flight of Storks which he described from the Enborne road, some few yards from the rectory. They were then going in a north-easterly direction." It is possible that if merely unmolested, to say nothing of being encouraged, as it is among most of the Teutonic races, the Stork might breed in this country.

In Ireland, which appears to be west of the line of its migrations, there is an authentic record of a bird in the collection of Dr. Harvey, of Cork, shot near Fermoy about the end of May 1846; and Mr. Hackett states (Zool. s.s. p. 524) that an example weighing 8 lbs. was killed in co. Cork on the 7th August, 1866.

Although the White Stork does not breed in Norway, it has been known as far north as Bergen, and it is an annual spring visitant to the south, where it experiences a reception as inhospitable as that of England. It breeds in the south of Sweden; also in Denmark; and south of the Baltic the nests are a familiar sight from Poland to Holland, Alsace, and Lorraine, where it is encouraged and protected, as it is throughout Central Europe. In France proper, owing to persecution, it is now only a migrant; and in Italy, Sicily, Sardinia, and Malta it appears to be of irregular occurrence; but in Spain it nests freely on the towers and belfries of the churches in the towns and cities, and on the 'almiares' or stacks of the farmhouses. It is equally abundant in the Danubian Provinces, Turkey, and Southern Russia; but in Greece and the islands of the Archipelago it is less common. It breeds in Asia Minor; and, sparingly, in Palestine, which it visits in great numbers on migration; the summer range extending through Persia to Central Asia; and during winter it is found in Baluchistan, and in India, according to Blyth, as far south as Calcutta. In Mongolia, Manchuria, Northern China, and Japan, our species is represented by *Ciconia boyciana*, in which the bill is black, and the bare space in front and behind the eye is vermilion-red, and not black as in our bird.

In the west, the White Stork has straggled to the Canaries; and is abundant from early spring to autumn throughout Northern Africa. A few winter in Algeria, and immense numbers migrate through Egypt. Southwards its winter range extends to Cape Colony, and there is tolerably good evidence that some pairs breed there, and in Natal. It is said that their nests are built in the neighbourhood of large swarms of young locusts, which remain for a long time near the spot where they are hatched, and thus afford food for the young Storks (Layard and Sharpe's 'B. South Africa,' p. 728).

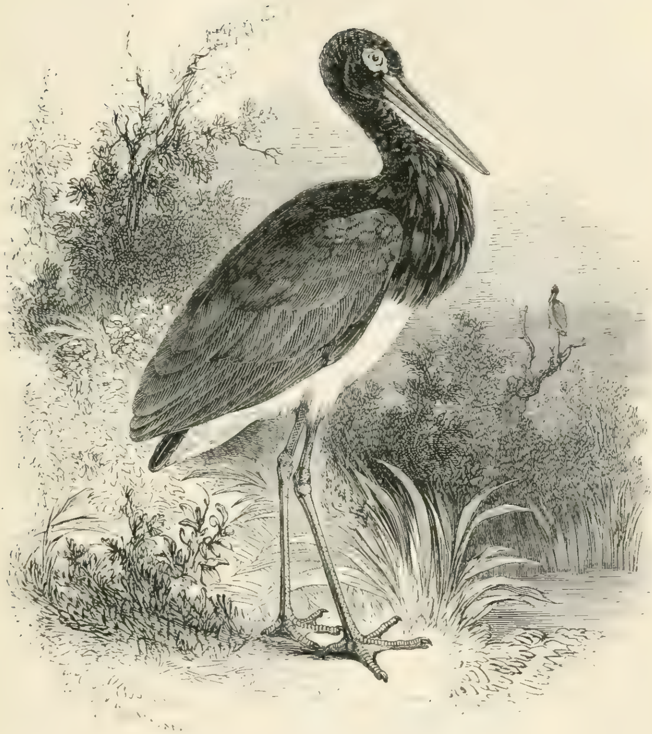
The White Stork, from its familiarity, and the services which it renders to man in some countries by the destruction of reptiles and the removal of offal, has secured for itself an especial protection, and an exemption from the persecution which is the lot of the less favoured of the feathered tribes. It stalks about in perfect confidence along the busy streets and markets of the most crowded towns, and seeks its food on the banks of rivers, or in fens, in the vicinity of its abode. Its periodical return to its accustomed nest, the home of many generations, has ever been regarded with feelings of pleasure; and its visits to the habitations of man have not only been permitted, but welcomed. The date of return depends upon the locality, and still more upon the season. In various parts of Europe the nest of this bird, built on the chimney top, remains undisturbed for many succeeding years; in Holland, and some districts of Germany, boxes and old cart-wheels are provided on the tops of the houses; and in several continental cities, he considers himself a fortunate man whose roof the Stork selects for its periodical nesting-place. Mr. Benzon, writing of Denmark, says, that if the nest is removed to another place, the Stork takes possession of it next season; and sometimes a peasant sells a Stork's nest to a neighbour, so as to bring him luck. The structure, composed of sticks and other coarse materials, is shallow, but being added to year by year, it sometimes attains the height of five or six feet. It is generally placed on buildings, but trees, and the ledges of cliffs, are sometimes selected. The eggs, from three to five in number, are pure white; the average measurements being 2·8 by 2·1 in. The yolk is of a very deep orange-colour. After a month's incubation the young are hatched, and, with great care, attended and watched alternately by the parents until fully fledged and able to provide for themselves. The old birds feed the young by inserting their own beak within the mandibles of the young bird, and passing from their own stomachs the half-digested remains of their last meal. Their affection for their young has passed into a proverb, and every one must be acquainted with the legend of the female which, at the conflagration of Delft, after repeated and unsuccessful attempts to carry off her young, chose rather to remain and perish with them in the general ruin than to leave them to their fate.

The White Stork feeds on reptiles, fish, aquatic insects, worms, small mammals, and young birds. Col. E. Delmé Radcliffe told the Editor that on one occasion he shot a Stork which was busily occupied with a brood of young Partridges, eight of which had already been swallowed. Grasshoppers are a favourite food, and on the 15th of May, 1868, the Editor observed thousands of Storks whitening acres of ground on the plains of Andalucia, and feeding with their heads down, just like sheep. Nine-tenths of these birds could not possibly have been breeding in the province. During the breeding-season Storks keep up a constant clappering with their bills, and this sound may frequently be heard proceeding from a number of birds circling in the air at such a height as to be almost invisible.

The adult bird has the beak red; the bare skin around the eye black; the irides brown; the whole of the plumage white, except the greater wing-coverts, the primary quill-feathers, secondaries, and tertials, which are black; legs and toes red; the claws brown.

The whole length is three feet six or eight inches. From the carpal joint to the end of the primaries, twenty-three inches.

Young birds have the quill-feathers dull black; the beak and legs brownish-red. The nestling is covered with a greyish-white down, and is well figured in the 'Birds of Great Britain' by the late Mr. Gould, who states that he procured it from Prof. Kaup of Darmstadt, after endeavouring in vain to obtain a specimen from any of his numerous German and Dutch correspondents.



CICONIA NIGRA (Linnæus*).

THE BLACK STORK.

Ciconia nigra.

THE first occurrence of the Black Stork in a wild state in this country was made known by Montagu, in a paper read before the Linnean Society on the 2nd of May, 1815. Montagu's bird was captured on West Sedgemoor, adjoining the parish of Stoke St. Gregory, Somersetshire, on the 13th of May, 1814, by means of a slight shot-wound in the wing,

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[*] *Ardea nigra*, Linnæus, Syst. Nat. Ed. 12. i. p. 235 (1766).

which did not break the bone, and the bird lived in his possession more than twelve months, in excellent health. This example is still preserved in the British Museum. Since that time the species has been observed on several occasions. Mr. Stevenson found in Mr. Joseph Clarke's MS. notes on rare birds at Yarmouth, a record that three Black Storks were followed in Norfolk for some days in the year 1823; and one, shot at Otley, in Suffolk, in October 1832, is stated by the late Rev. J. Mitford (Jesse's Gleanings, 3rd Ser. ii. p. 188) to have been in the possession of Mr. Acton [erroneously printed Diton], of Grundisburgh, near Ipswich. In November 1831 a specimen was obtained on the Tamar or the Lynher, on the borders of Devon and Cornwall, and was recorded by the late Dr. E. Moore, who saw the bird while warm. On the 22nd November, 1839, a Black Stork, in the collection of the Earl of Malmesbury, at Heron Court, Christchurch, was killed in Poole Harbour, Dorsetshire; and in the same locality another, now in Mr. J. H. Gurney's collection, was obtained in 1849. In Kent, one was shot prior to 1844 in Romney Marsh; and on the 5th of May, 1856, another was obtained near Lydd in the same district. A fine specimen was shot on Market Weighton Common in 1852, and is now in the Museum of the Yorkshire Philosophical Society. In Durham one, near Hartlepool, in August 1862, was recorded by and came into the possession of Mr. Christy Horsfall (Zool. p. 8196). Mr. Gould, in his 'Birds of Great Britain,' mentions an example obtained at Otmoor in November 1862; and this is possibly the same which is said by Mr. C. M. Prior to have been shot on the 5th August, 1865, on Osmoor, a large tract of low-lying land some nine miles N.E. of Oxford (Zool. 1877, p. 180). On the 19th of May, 1867, an adult female was shot in Norfolk at Westacre, where it had been living about the river for a week or more, as recorded by Mr. Anthony Hamond, jun. (Ibis, 1867, p. 382), in whose collection it now is. Mr. J. H. Gurney, jun., states, in Mason's 'History of Norfolk,' that one was shot at Breydon, on the 27th of June, 1877. Lastly, a bird of this species appears to have been killed between July and the 8th of September, 1883, near Rainham in Essex (Zool. 1884, p. 429).

There is no record of the occurrence of the Black Stork in Scotland; and as regards Ireland, the only evidence is the statement of Giraldus Cambrensis (1183–86), who says, in his 'Topographia Hibernica,'—"Ciconiæ vero per totam insulam rarissimæ sunt illæ nigræ."

The Black Stork is only a straggler to Norway; but it breeds sparingly in the forests of the south of Sweden; Denmark; Brunswick, Hanover, Pomerania, and some other parts of Germany; Poland; Central and Southern Russia; the Danubian provinces; and Turkey. It also nests in Spain; and is said to visit Madeira. In the rest of Europe it occurs as a migrant. To the eastward, it is known to breed in Palestine, and it can be traced through Persia, Turkestan, Siberia up to 55° N. lat., and Mongolia, to China, where, according to Swinhoe, it nests on the cliffs of the mountains near Pekin; and it winters as far south as Central India. It is found throughout Northern Africa, from Morocco to Egypt, Nubia, and Abyssinia; and it appears to be generally distributed throughout that continent down to Cape Colony.

The character of the Black Stork, as observed by many ornithologists, is in one respect diametrically opposed to that of the White Stork. Instead of domesticating itself, as it were, with man, it shuns his society, and makes its temporary dwelling in the most secluded spots, frequenting impenetrable morasses, or the banks of such rivers and lakes as are seldom disturbed by the presence of intruders, and building its nest on forest trees. Mr. H. J. Elwes, who visited four out of the ten or twelve nests which still exist in Jutland, describes one as a large and heavy mass of sticks, about four feet in diameter, lined with tufts of green moss, so as to form a shallow depression about two feet across, situated about thirty-five feet from the ground, in a good-sized beech-tree. Another was on an old nest of the White-tailed Eagle, in a small beech, overlooking a wide marshy valley in the forest (Ibis, 1880, p. 389). Mr. Seebohm describes two similar nests, situated respectively on an old oak and a Scotch fir. Mr. W. H. Hudleston in Bulgaria, Messrs. Elwes and Buckley in Turkey, the Editor in Spain, and others, have also found this species nesting in clefts and on ledges of cliffs. The eggs are usually four in number; coarse in texture; of a dull greyish-white colour, similar to that of the egg of a Goshawk; and when the shell is held up to the light, the lining membrane shows *green*, whereas it is yellowish in the egg of the White Stork; the average dimensions of the egg also are smaller, being about 2·6 by 2 in. The male stands by the female while she is sitting, and both birds show comparatively little fear of visitors to their haunts. Incubation commences in April, and Mr. Seebohm found young just hatched on the 19th May. As a rule the Black Stork arrives at its breeding-stations rather earlier than its congener, leaving later in the autumn; in fact, it has once been obtained in Sweden in winter.

The habits of Montagu's bird in confinement are thus related in the communication to the Linnean Society that has already been referred to:—

"Like the White Stork, it frequently rests upon one leg; and if alarmed, particularly by the approach of a dog, it makes a considerable noise by reiterated snapping of the bill, similar to that species. It soon became docile, and would follow its feeder for a favourite morsel—an eel. When very hungry it crouches, resting the whole length of the legs upon the ground, and supplicantly seems to solicit food by nodding the head, flapping its unwieldy pinions, and forcibly blowing the air from the lungs with audible expirations. Whenever it is approached, the expulsion of air, accompanied by repeated nodding of the head, is provoked. The bird is of a mild and peaceful disposition, very unlike many of its congeners; for it never makes use of its formidable bill offensively against any of the companions of its prison, and even submits peaceably to be taken up without much struggle. From the manner in which it is observed to search the grass with its bill, there can be no doubt that reptiles form part of its natural food;

even mice, worms, and the larger insects, probably add to its usual repast. When searching in thick grass, or in the mud, for its prey, the bill is kept partly open; by this means I have observed it take eels in a pond with great dexterity: no spear, in common use for taking that fish, can more effectually receive it between its prongs than the grasp of the Stork's open mandibles. A small eel has no chance of escaping when once roused from its lurking-place. But the Stork does not gorge its prey instantly, like the Cormorant; on the contrary, it retires to the margin of the pool, and there disables its prey by shaking and beating with its bill, before it ventures to swallow it. I never observed this bird attempt to swim; but it will wade up to the belly, and occasionally thrust the whole head and neck under water after its prey. It prefers an elevated spot on which to repose: an old ivy-bound weeping-willow, that lies prostrate over the pond, is usually resorted to for that purpose. In this quiescent state the neck is much shortened by resting the hinder part of the head on the back: and the bill rests on the fore part of the neck, over which the feathers flow partly so as to conceal it; making a very singular appearance.

"The Black Stork, perhaps, is not more delicate in the choice of its food than the White species: fish appears to be preferred to flesh; but when very hungry any sort of offal is acceptable.

"All birds that pursue their migrative course by night in congregation, have undoubtedly some cry by which the whole assembly is kept together: yet it would appear that at other times the Black Stork is extremely mute; not a single note has been heard to issue from the bird in question since its captivity."

Montagu's correspondence with the gentleman from whom he obtained his Black Stork, will be found in 'The Zoologist' for 1850, page 2700, communicated by the late Wm. Baker, of Bridgewater, himself an excellent naturalist.

A very fine specimen of the Black Stork in the menagerie of the Zoological Society in the Regent's Park was perfectly quiet, never using its powerful beak as a weapon of offence against its fellow-prisoners, and making no noise except the clattering sound which it produced by the snapping of its mandibles. This Black Stork stood for its portrait to illustrate the ornithological works of Bennett, Selby, Gould, Meyer, and the Author.

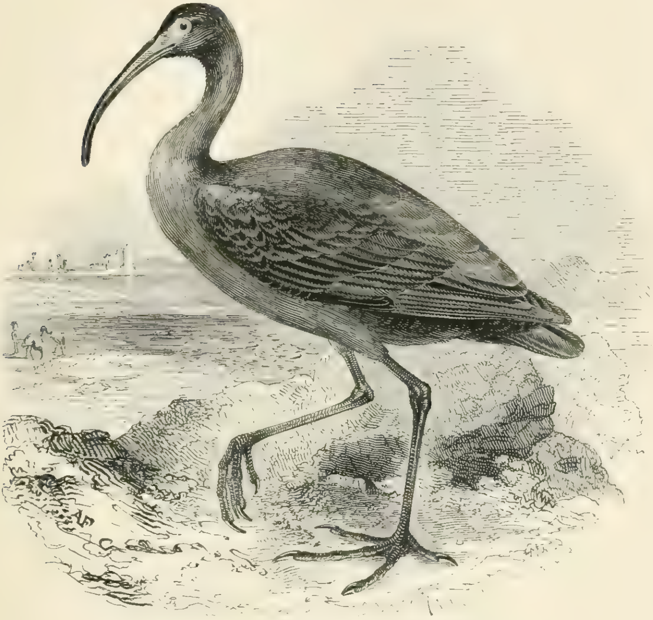
In the adult bird the beak, and the naked skin around the eye, are scarlet; the irides reddish-brown; the head, neck all round, upper surface of the body, wings, and wing-coverts, are glossy black, varied with blue, purple, copper-coloured, and green reflections; the primary quill-feathers and the tail black; the whole of the under surface of the body, from the bottom of the neck to the ends of the under tail-coverts, white; the legs and toes scarlet; the claws black.

There is no difference in the plumage of the sexes.

The whole length of the specimen killed in Dorsetshire was three feet four inches. From the carpal joint to the end of the wing, twenty-one inches; the length of the beak from the point to the angle of the gape, seven inches; length of the middle toe four inches; of the tarsus eight inches; of the naked part above, four inches and a half.

The colours in this specimen, which were not those of mature age, are thus described. Head and neck dusky-brown; wings, tail, and back, black or dusky-brown, with purple reflections; lower part of breast and belly white; bill and orbits bright orange; irides hazel; legs and toes pale red. In very young birds the beak, the naked skin around the eyes, and the legs, are olive-green, the head and neck being then of a reddish-brown.

The nestling is covered with a yellowish-grey down.



PLEGADIS FALCINELLUS (Linnæus*).

THE GLOSSY IBIS.

Ibis falcinellus.

PLEGADIS, *Kaup*†.—Beak long, slender, decurved, large at the base, the point depressed, obtuse, rounded; upper mandible deeply grooved throughout its length. Nostrils on the upper surface and near the base of the beak, oblong, narrow, pierced, in a membrane which covers part of the aperture. Face and lores naked, without feathers. Legs rather long, naked above the tarsal joint; three toes in front, one behind; the anterior toes united by a membrane; hind toe long, and resting its length on the ground. Tail of twelve feathers, moderate, even. Wings moderate; the first quill-feather shorter than the second and third, which are the longest in the wing. Pterylosis more or less stork-like, wanting the powder-down tracts of the Herons.

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* *Tantalus Falcinellus*, Linnæus, Syst. Nat. Ed. 12, i. p. 241 (1766).

† Natür. System, p. 82 (1829); from πληγάς, a sickle.

The family of the Ibises, of which *Plegadis* forms a somewhat out-lying genus, has no real affinity to the Curlews, with which, owing to a superficial resemblance in the shape of the bill, it was formerly associated. On the contrary, its relationship is with the Storks (*Ciconiidæ*), and, more closely, with the Spoonbills (*Plataleidæ*). The egg of the Sacred Ibis is similar to that of the Spoonbill (*cf.* Ibis, 1878, p. 449), and so are, probably, the eggs of the other typical species; but the members of the small group of which the Glossy Ibis forms part, differ from the typical Ibises in laying bluish-green eggs.

As pointed out by Montagu, the Green, the Glossy, and the Bay Ibis of authors, with the various systematic names in use among ornithologists, refer only to various states of the same bird, depending on age or season. The appearance of the Glossy Ibis in this country, though not uncommon, is still accidental; and there is no evidence to show that it ever bred in our islands. Lubbock, writing in 1845, remarked that fifty years back it was seen in Norfolk, often enough to be known to gunners and fishermen as the 'Black Curlew'; but it was rapidly becoming rare; and although Mr. Stevenson enumerates eleven instances of its occurrence between 1818 and 1833, yet since the latter date only three have been met with in that county. It has also been obtained in the neighbouring county of Suffolk. Two were killed at Skegness, in Lincolnshire, in the autumn of 1881; and two have been obtained in the south-east of Yorkshire. Selby mentions a young bird in his own collection, obtained on the Coquet near Rothbury, in the autumn of 1820; and from this specimen the representation of the Ibis published in some of the later editions of Bewick's British Birds was taken. In Scotland it becomes still rarer, and only six occurrences are on record; the first being that of an adult bird killed on the borders of the Loch of Kilconquhar, on the coast of Fife, in September 1842, by Mr. Hepburn, who communicated the fact to the Author. About the year 1844 one was shot near Banchory, in Kincardineshire, and its wings given to Macgillivray, who also mentions one obtained in Ayrshire. One was shot near Kirkwall, in Orkney, in October 1857 ; and an immature bird at Unst, in the Shetlands, in October 1862, after a south-westerly gale. On the 4th October, 1880, a male in good condition was shot on the mud-flats near the mouth of the Ythan, Aberdeenshire.

On the western side of England this species is decidedly uncommon, but it has occurred several times in Lancashire, and, according to Montagu, "The Ibis is adopted as a part of the arms of the town of Liverpool. This bird is termed a *Liver*, from which that flourishing town derived its name, and is now standing on the spot where the *Pool* was, on the verge of which the *Liver* was killed." The arms of the town of Liverpool are, however, comparatively modern, and seem to have no reference to the Ibis. The bird which was adopted in the arms of the [extinct] Earls of Liverpool, was described in a former edition of Burke's Peerage as a Cormorant holding in the beak a branch of sea-weed. In the Plantagenet seal of Liverpool, which is believed to be of the time of King John, the bird has the appearance of a Dove bearing in its bill a sprig of olive, apparently intended to refer to the advantages that commerce would derive from peace. For a drawing of this ancient seal, with various other particulars, and also for a notice of the occurrence of an Ibis near the town of Fleetwood, on the river Wyre, the Author was indebted to the kindness of Mr. John Skaife, of Blackburn.

The Rev. Hugh Davis, the friend of Pennant, has noticed that a flock visited Anglesey, of which four or five were shot ; and a bird was obtained in Caermarthenshire in April 1858. Two were seen, and one shot, near Shrewsbury, on the 3rd October, 1853. In Cornwall and the Scilly Islands several occurrences have been recorded, at considerable intervals, and always in the autumn. To Devonshire its visits have been rather more frequent, although they have rarely extended to Somersetshire ; and a good many birds have been attracted by the congenial district near Poole Harbour in Dorsetshire. Examples have occurred from time to time on the coasts of Hampshire, Sussex, and Kent ; and a few have been known to stray to Surrey, Berkshire, Hertfordshire, and other inland counties.

In Ireland the Glossy Ibis has occurred either singly or in small flocks, generally in autumn or early winter, in the southern counties of Waterford and Cork, and, more rarely, in Wexford, Dublin, King's County, and Longford; also once in Belfast; but it has not yet been recorded from the western side of the island.

This species has been known to straggle to Iceland, the Færoes, Norway, Sweden, Denmark, and the Baltic provinces; but its occurrence to the north of about 50° N. lat. can only be considered accidental. Southwards it becomes more common, and it is believed to breed in the Camargue, near the mouth of the Rhone, as it undoubtedly does in the marshes of the south of Spain. To the islands of the Mediterranean and the countries washed by that sea, it is a regular migrant; but its principal breeding-places in Europe are in the marshes of Slavonia, Hungary, the valley of the Danube, and South Russia, from the Black Sea to the Caspian. Eastward it has been found in suitable localities in Asia, as far as 48° N. lat.; and it is known to breed in Sind and in Ceylon. Other parts of India are visited by it in winter, at which season it also appears to range from Burmah, through the Eastern Archipelago, to South Australia. It nests in suitable localities in North Africa, and occurs in winter and on its migrations, in Egypt, Nubia, Kordofan, and Abyssinia. On the east side it is said to have been found as far south as Natal; also in Madagascar; but Messrs. Sharpe and Layard do not mention it as occurring in Cape Colony, in their 'Birds of South Africa'; and on the west it has not been traced south of Benguela.

In North America, according to Messrs. Baird, Brewer, and Ridgway, this same species occurs sparingly from New England to Nevada, where it has been found breeding; it is also said to breed in Florida, and to visit Mexico, Cuba, and the Bermudas; there is, however, a little uncertainty as to whether some of these records may not refer to the representative species on the American Continent, *Plegadis* *guarauna*, which has a white margin of feathers surrounding the bare space on the head. In Peru and Chili there is a third species, *P. ridgwayi.*

Mr. W. E. Clarke found the Glossy Ibis breeding by thousands in the great bird-colony already mentioned on the Obedska 'bara' in Slavonia, where a single bush contained one nest of Common Heron, two of Pigmy Cormorant, three of Night-Heron, two of Little Egret, one of Squacco, and three of this species, many other bushes and trees being equally laden. The nests of the Ibis were somewhat large structures formed of sticks and a few reeds, placed on the lower branches of sallow-bushes, never more than two feet above the water, and most of them had the appearance of floating on the surface, being supported by submerged boughs. In Sind, Mr. Doig found the nests on the top of 'kundy' trees, and in a colony visited by Col. Legge, in Ceylon, in March 1872, the nests, described as small and almost flat, were placed upon the horizontal forks of small branches in thorny trees. The eggs, three or four in number, are oval and of a beautiful greenish-blue, roughly pitted over with slight indentations; average measurements 2 in. by 1·5 in. The young, when still unable to fly, are described by Col. Legge as climbing actively among the branches of the trees in which the nests are placed, clinging so firmly with their feet as to be removed with difficulty.

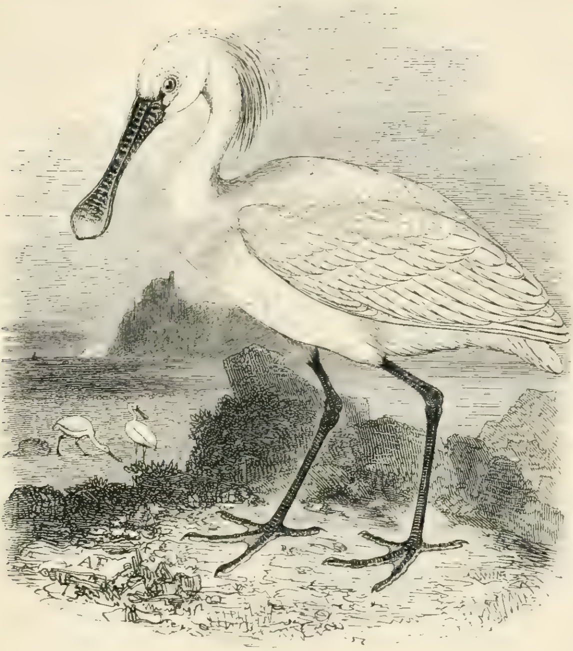
In Europe the Glossy Ibis lives principally on the banks of rivers, and on the shores of lakes or muddy flats which are occasionally flooded over; feeding on small reptiles, the fry of fishes, small crustacea, aquatic insects, worms, and other soft-bodied animals. On the plains of Africa, according to Von Heuglin, its diet consists of beetles, scorpions, and especially locusts. In its flight the pinions are beaten rapidly, producing a whizzing sound, after which the bird skims for some distance.

In the adult bird the beak is dark purple-brown, the lore and the naked skin around the eyes olive-green, tinged with grey; the irides hazel; the head, the neck all round, and the interscapulars, deep reddish-brown; wing-coverts and tertials dark maroon-brown with brilliant green and purple reflections; wing-primaries dark brownish-black, tinged with green; tail-feathers brownish-black, tinged with purple; breast, sides, and belly, deep reddish-brown, like the neck; the under surface of the wings, the flanks and under tail-coverts, dark brown; the legs and toes bronzed-brown, the claws olive-brown.

The whole length of the bird is about twenty-two inches. From the carpal joint to the end of the wing ten inches and three-quarters; the first quill-feather shorter than the second and third, which are nearly equal in length and the longest in the wing.

In young birds the head, cheeks, and upper part of the neck behind are dull clove-brown, intermixed with short hair-like streaks of greyish-white; on the throat in front, one and sometimes more patches of dull greyish-white, placed rather transversely; the whole of the body above and below, the wings and the tail, dull uniform liver-brown, with very little of the glossy tints observable in older birds, which are obtained gradually. When barely able to fly, the plumage is entirely brown, with a faint lustre on the wings.

The nestling is covered with a close black down, with a yellowish V-shaped band over the crown; throat barred with dull white; bill yellow, with a black tip, and a black band across both mandibles near the base; legs and feet dull flesh-colour.



PLATALEA LEUCORODIA, Linnæus.*

THE WHITE SPOONBILL.

Platalea leucorodia.

PLATALEA, *Linnæus*†.—Bill very long, strong, very much flattened, dilated at the point, rounded in the form of a spoon; upper mandible channelled and transversely grooved at the base. Nostrils on the upper surface of the beak, near together, oblong, open, bordered by a membrane. Forehead, lore, orbits, and chin, naked. Legs long, strong, three toes in front, united as far as the second articulation by a membrane, the marginal edge of which is deeply concave; hind toe long. Wings rather large; the third quill-feather nearly as long as the second, which is the longest in the wing.

THE SPOONBILL is recorded as a British bird by Merrett, on the authority of Dr. Turner, and Sir Robert Sibbald speaks of it in his time as an accidental visitor to Scotland; adding that he had received it from Orkney. Sir Thomas Browne, who was contemporary with Merrett and Sibbald, mentions "The Platea or Shovelard, which build upon the tops of high trees. They formerly built in the Hernery at Claxton and Rudham; now at Trimley in Suffolk. They come in March, and are shot by fowlers, not for their meat, but their handsomeness; remarkable in their white colour, copped crown, and spoon, or spatule-like bill." Willughby also describes a young Spoonbill taken out of the nest, perhaps at Trimley. Mr. J. E. Harting has drawn attention (Zool. 1877, p. 425) to an interesting record of the breeding of the Spoonbill in Sussex. In a MS. survey of certain manors taken in 1570, is a memorandum relating to various parks, including Goodwood, and it is stated that "in the woods called the Westwood and the Haslette, *Shovelers* and *Herons* have lately breed [*sic*], and some *Shovelers* breed there this year." It is clear that this relates to the present species, and cannot possibly refer to the Shoveller Duck.

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* *Platalea Leucorodia*, Linnæus, Syst. Nat. Ed. 12, i. p. 231 (1766).

† *loc. cit.*

Pennant has recorded the visit of a flock of Spoonbills to the marshes near Yarmouth in April 1774; and since that date many have from time to time been observed—and, so far as possible, killed—in Norfolk, Suffolk, and the eastern counties of England: probably sixty or more. To the south coast its visits have been less frequent, yet examples have been obtained in Sussex, Surrey, Hampshire, Dorsetshire, Somersetshire, Devonshire, rather numerously in Cornwall; also in Gloucestershire, Worcestershire, Aberystwith in Wales, and in Middlesex and other counties along the Thames valley. In the north the occurrences of the Spoonbill are far more rare, but Mr. Clarke enumerates nine instances in Yorkshire.

In Scotland it has been observed in East Lothian; also in the Outer Hebrides. In the Orkneys, besides the instance already mentioned by Sibbald, six young birds were shot out of two flocks, in October 1859, and the species has been obtained in Shetland.

To Ireland the Spoonbill is a very irregular visitor, principally to the southern districts; occurrences being on record in the counties of Cork, Kerry—where three specimens were obtained so early in the year as the month of February—Waterford, Wexford, and Dublin; also in the north, in Antrim, and doubtfully in Donegal.

In Scandinavia the Spoonbill is a rare straggler; but in Russia it has been obtained as far north as Archangel, and it breeds in the latter country to the south of 56° N. lat.; also, sparingly, in some parts of Poland and Central Germany. In spite of the drainage which almost annually restricts its breeding area, it still nests in several localities in Holland, where it usually arrives in April, leaving in September; but occasionally it has been taken there in the depth of winter. In France it is now only known on passage, but in the time of Belon it used to nest on trees in Brittany and Poitou. It breeds in Spain, and is of general distribution on migration and in winter throughout the basin of the Mediterranean. The valley of the Danube and Southern Russia afford it suitable breeding-haunts; in Asia Minor, Dickson and Ross found it nesting freely on the river near Erzeroum in May; and its summer range stretches across the southern portions of Siberia to the Amoor, Mongolia, Northern China, and perhaps to Japan. In India, where it is generally distributed, Mr. A. O. Hume states that he is acquainted with at least fifty of its breeding-places; and Col. Legge found it nesting in small numbers in the south-east of Ceylon. It visits the Azores, Madeira, and the Canaries; and it appears to be resident throughout North Africa down to the Somali coast, as Von Heuglin visited large breeding colonies in June in the Dahalac Archipelago. In South Africa it is replaced by *Platalea tenuirostris;* and representative species are found in south-eastern Asia and Australia. The Roseate Spoonbill of America belongs to a different genus (*Ajaja*), and presents some important structural variations from the Old World type.

Up to the end of the year 1882 the Spoonbill nested no further from our shores than the Horster Meer, between

Amsterdam and Utrecht, and visits to that colony have been described by Messrs. Sclater and Forbes (Ibis, 1877, p. 412), and by Mr. Seebohm (Zool. 1880, p. 457). Since its drainage, the Spoonbills have moved to the Naarden Meer, about fifteen miles from Amsterdam, covering about 2,300 acres in extent, of which a thousand are now being drained; so that the destruction of another breeding-place of this interesting bird can only be a question of time. Mr. Alfred Crowley, already mentioned in the account of the breeding of the Purple Heron, has furnished the Editor with the following description of his visit on the 27th of May, 1884:—"Taking a small boat in tow, we were punted across the open water, over which were flying numbers of Sand Martins, Swifts, Common and Black Terns, and Black-headed Gulls, the reeds being full of Coots, Moorhens, Sedge and Reed Warblers, &c., and in the distance we saw, rising above the reeds occasionally, a Spoonbill or Purple Heron. On nearing a large mass of reeds, one of the boatmen struck the side of the punt with the pole, when up rose some fifty Spoonbills and eight or ten Purple Herons; and as we came closer to the reeds there were soon hovering over our heads, within easy shot, some two hundred of the former and fifty or sixty of the latter. Strange to say, not a note or sound escaped from the Spoonbills, and only a few croaks from the Herons. On reaching the reeds we moored our punt, and two of the men, wading in the mud, took us in the small boat about fifty yards through the reeds, where we found ourselves surrounded by Spoonbills' nests. They were placed on the mud among the reeds, built about a foot or eighteen inches high and two feet in diameter at the bottom, tapering to about one foot at the top, where there was a slight depression, in which lay four eggs, or in most cases four young birds; many ready to leave the nest, and several ran off as we approached. In the nests with young there was a great difference in age and size, one being about a day or so old, and the oldest nearly ready to leave the nest—some two or three weeks old; so that evidently the birds lay their four eggs at considerable intervals, and begin to sit on depositing the first. After wandering about, a matter of difficulty on account of the mud, we found a clutch of only three eggs, and one of four, which I managed to blow. We also obtained two clutches of eggs of the Purple Heron, but some of the latter had young."

At Erzeroum, Dickson and Ross state that in May "several nests are placed near each other, about the middle of the river. They are made of reeds, bound together by weeds, which are piled up a few inches above the water's edge. Over this foundation dried reeds are placed in various directions, to form the body of the nest, which is not lined with anything, and is just large enough to allow one bird to sit, and the other to stand beside it: four eggs were found in each." In India Mr. Hume describes the Spoonbill as breeding in large colonies, along with nearly allied species, on tamarind- and peepul-trees—frequently in villages—in the month of August; and in Ceylon Col. Legge found the species nesting also, on trees, in March. The eggs, usually four in number, are rough in texture, of a dull white, streaked and spotted with reddish-brown; average measurements, 2·5 by 1·8 in.

The Spoonbill feeds on small reptiles and fishes, mollusca, aquatic insects, shrimps, sand-hoppers, &c., many of which it finds when feeding at pools on the sea-shore. Wolley noticed that in feeding the beak was passed sideways through the water, and kept open till something palatable came within its grasp; but the action by which the bird effected this was most singular, for instead of turning only its head and neck, it turned its whole body from left to right and from right to left, like the balance-wheel of a watch, its neck stretched out, and its beak immersed perpendicularly to about half its depth; this semicircular action was kept up with great vigour, and at a tolerably quick march (Zool. p. 1213). Its flesh is dark in colour, but it is said to be of good flavour, and without any fishy taste. In captivity it is quiet and inoffensive, and, in common with the various species to which it is allied, will feed on any sort of offal.

In the adult male bird the beak is black, except the rounded part near the point, where it is yellow; the naked skin under the tongue and on the throat is also yellow; the irides red; the whole of the plumage pure white, except a band of feathers at the bottom of the neck in front, which is of a buff colour, and this tint extends upwards on each side in a narrow stripe to the top; there also is a roseate blush observable in some of the dorsal feathers, towards their roots, being especially apparent in, and, as it were, radiating from, the shafts of the feathers. Some of the feathers of the occiput are elongated, forming a conspicuous plume; the legs, toes, and claws are black; the toes connected by a considerable expanse of membrane, which is concave at the margin between the toes.

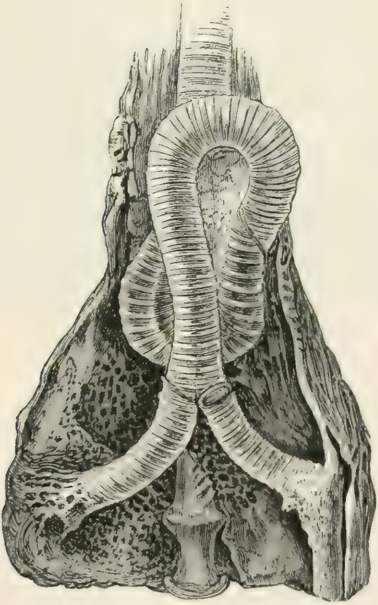
The whole length of the bird, from the point of the beak to the end of the tail, is about thirty-two inches; of which the beak in an old male will measure nearly nine inches; from the carpal joint to the end of the wing fourteen inches and a half; the first quill-feather not quite so long as the fourth; the second and third equal in length, rather longer than the fourth, and the longest in the wing.

The females are not so large, at the same age, as males, and have a smaller occipital crest; but they are not otherwise dissimilar.

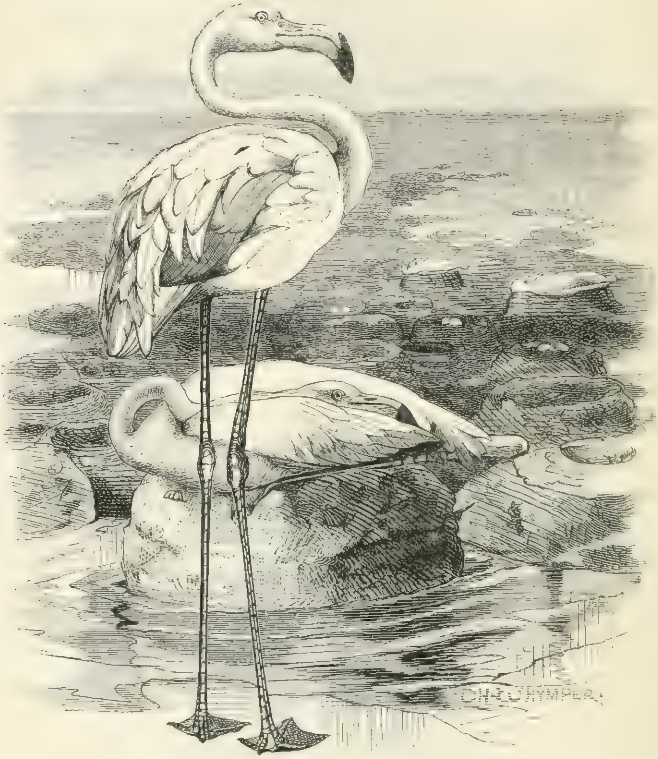
In young birds the beak is not so large, it is softer in its texture, more flexible, and of a dark livid flesh-colour; the naked parts about the head paler; the irides ash-colour; the shafts and the ends of the quill-feathers are black, and there is no indication of the elongated occipital feathers, which at mature age are borne by both sexes.

The Spoonbill possesses a peculiarity of internal structure much too interesting to be passed over. This bird is one of the very few which has been found to possess no true muscles of the organ of voice, and no modulation of its single tone appears to be possessed by the bird. The illustration inserted on the next page is a representation of part of the inside of this bird, with the figure-of-8-like convolutions of its singular windpipe in the natural situation in front of the lungs; the insertion of the bronchiæ into the lobe of the lungs on each side is shown. In a young Spoonbill taken from the nest, and examined by Willughby in reference to this particular structure which is said to have been first noticed by Aldrovandus, this peculiarity was not found; and as it has proved to be wanting in other immature examples (*cf.* Zool. 1880, p. 514), it would appear that this formation of the vocal organs (which is known to exist in old females as well as in old males), is, like the occipital crest, obtained by neither sex till they have acquired a certain degree of maturity.

The representation below is one-third less than the natural size.



ODONTOGLOSSÆ. *PHŒNICOPTERIDÆ.*



PHŒNICOPTERUS ROSEUS, Pallas.*

THE FLAMINGO.

PHŒNICOPTERUS, *Brisson* †.—Bill longer than the head, abruptly bent in the middle, edges of both mandibles furnished with fine transverse lamellæ ; nostrils linear, sub-basal. Neck very long and slender. Wings moderately long, the first quill-feather slightly the longest ; the inner secondaries longer than, and folding over, the closed primaries. Tail short, even. Legs very long and slender ; the chief portion of the tibia bare ; tarsus broadly scutellate ; toes

* Zoographia Rosso-Asiatica, ii. p. 207 (1811).

† Ornithologie, vi. p. 532 (1760).

short, the three anterior ones palmate, with incised webs, hind toe elevated, free, and small; claws flattened, obtuse.

The Flamingo is an inhabitant of Southern Europe, but there can be no doubt that it occasionally straggles to the northern portions of that continent. Naumann states that one was shot at Alzey in Hesse Darmstadt; and during the hot summer of 1811, six birds in the plumage of the second year were shot on the Rhine out of a flock of twenty-seven; a number of others being observed passing over Bamberg on the 25th of June, and a few being seen in various places in July of the same year. A. von Homeyer has recorded the capture of an adult in Pomerania in September 1869. In France the Flamingo frequents the great marshes and salt-lakes near the mouth of the Rhone, where it certainly deposited its eggs in considerable numbers so recently as 1869, although perhaps hindered in the work of reproduction by persecution both then and in subsequent years; and stragglers not unfrequently ascend the valley of the Rhone up to the lakes of Savoy. In Siberia one is known to have been obtained so far north as the vicinity of Irkutsk, in 52° N. lat. Considering the above facts, it is not remarkable that the Flamingo should have occurred on several occasions in England; nor does it appear to the Editor that there are sufficient grounds for the assumption, without evidence, that *all* the examples observed must necessarily have been birds which had escaped from confinement. Inasmuch as there are two American Flamingoes which are also well known in confinement, and are quite as likely to have escaped, it is significant that there should be no records of the occurrence of any but the present species.

A Flamingo was recorded by Mr. A. J. Jackson, in 'The Field' of the 16th of August, 1873, as having been shot in the Isle of Sheppey on the 2nd of that month, having previously been observed in Essex; but in reply to an inquiry the Editor has been informed by Mr. Bartlett, of the London Zoological Gardens, that a bird escaped on the 19th of July, and was perhaps the above. No such suspicion attaches to a Flamingo captured in Staffordshire, respecting which Sir John H. Crewe, Bart., informs the Editor that the bird was seen for a week or so on his property in the northern part of the county, quite early in September 1881. At that time it was probably completing the moult of its primaries and rectrices; for, having crossed the river Manifold to another property, it was stoned and captured by some youths, who took it to the owner of the land, by whom it was kept alive for a few days and then killed. The specimen was a richly-coloured adult, and still exists, although very badly stuffed. Sir John adds that he made all inquiry he could at the time, at the Zoological Gardens, and other likely places, without being able to hear of the escape of any bird of this species.

In 'The Zoologist' for 1884 (p. 338), the following particulars are given by Lord Henry Scott respecting a Flamingo shot in Hampshire:—"I have referred back to my journal, and find that the Flamingo was shot on the 26th of November, 1883. It had been flying about on the mud banks outside the Beaulieu river for a fortnight previously, and many people had gone out to try to shoot it. It was very wild and wary, and no one had been able to get within gunshot of it, as it was able to fly extremely well, and never allowed any boat to approach near enough to it. The coast-guardsmen frequently shot at it with their rifles. When I heard that the bird was being thus shot at, and had been at the mouth of the river so long, I sent a keeper of mine (a naval pensioner and a capital hand with the punt-gun) in the gunning-punt to try and get the bird for me. In this he succeeded, but was not able to get nearer than about 120 yards. He was laying the punt-gun on the bird at about that distance, hoping he might get nearer and shoot it with the shoulder-gun, when the Flamingo, being on the alert and very wild, rose on the wing, and my keeper Goff fired the punt-gun at it and brought it down with three shots through it. The bird is a very fine grown one, quite pink all over, and with a good scarlet wing. There was nothing to show that it could have been in captivity.

for its wings were quite perfect, and it was extremely wild and could fly well, taking long flights. I cannot remember much about the weather previous to the bird being seen off the Beaulieu river, for I only returned home on the 20th from Scotland; but there had been a great gale from the south-west about a fortnight before, and it is my belief that the Flamingo had been blown by this gale to the British shores. Whether it came from North Africa or from the south of France (mouth of the Rhone) it is impossible to tell; but that the bird was a wild one, and had been blown to England by stress of weather, I have no doubt." In this case again there appears to be no evidence that the bird had escaped from confinement.

Lastly, Capt. G. E. Shelley informs the Editor, that on the 12th August, 1884, when waiting for the evening flights of Curlews, near New Romney, an adult Flamingo flew past with outstretched neck and legs, in a south-easterly direction, its red wings and black primaries showing clearly in the light of the setting sun; and his two nephews, who put the bird up, told him that they got within about fifty yards of it while it was feeding by the sea amongst a flock of Gulls.

As already stated, the Flamingo is an annnal visitor to the salt-marshes and brackish lagoons of the south of France; and M. Roussillon, who has taken hundreds of eggs at the mouth of the Rhone, informs the Editor that in some years from one to two thousand arrive to make their nests on the margins of the *étangs;* they do not, however, nest in the same place every year, the amount of water influencing their choice of site; and they suffer much from persecution. The same may be said of similar localities at the mouth of the Guadalquivir in the south of Spain; and Prof. Giglioli believes that a few pairs breed from time to time on the lagoons of the Island of Sardinia, where numbers are found in winter. The species occurs in suitable places throughout the basin of the Mediterranean; its range extending from the Canaries and the Cape Verd Islands on the west, across Africa and Asia to Lake Baikal. Southwards it can be traced to Cape Colony, and to Ceylon. There is great difference in the dimensions of individual birds, as well as in the degrees of the rosy tints with which their plumage is suffused; and to these circumstances are, perhaps, attributable the separation of the allied forms *Ph. erythræus*, *Ph. minor*, and *Ph. rubidus*. In North America the representative species is the very distinct *Ph. ruber;* in South America it is *Ph. ignipalliatus;* and on the lofty plateaux of the Andes is found the remarkable *Ph. andinus*, in which the hind toe is absent, for which reason the species has been placed by Bonaparte in a different genus. Fossil remains of a Flamingo have been found in the Lower Middle Tertiary formations in France; and several extinct genera from the lacustrine deposits of the Miocene period have been referred to this family.

The earliest account of the nest of the Flamingo appears to be that which is given by Dampier in his 'Voyages,' Vol. I. pp. 70, 71. On his visit to Sal, one of the smaller of the Cape Verd Islands, in September 1683, he saw the old nests in the form of hillocks, and the young hatched that year, as well as the adults, and so far his descriptions of them are tolerably accurate. He goes on to say that the birds, when incubating, stand with their legs in the water, "resting themselves against the Hillock, and covering the hollow Nest upon it with their Rumps; for their Legs are very long; and building thus as they do upon the Ground they could neither draw their Legs conveniently into their Nests, nor sit down upon them otherwise than by resting their whole Bodies there, to the Prejudice of their Eggs or their Young, were it not for this admirable Contrivance which they have by natural Instinct." In this he is obviously speaking upon hearsay evidence, probably derived from the Governor and the five or six men who were the only inhabitants of that island, for in September no birds would have been sitting on their eggs, and Dampier expressly says that he never saw the nests or young of the Flamingo in any other part of the world. His statement has, however, been generally, if not universally, accepted, for want of a better, inasmuch as no competent observer had succeeded until the year 1883, in watching the manner in which the Flamingo performed the task of incubation. Eggs have indeed been obtained by the bushel, but the wariness of the birds precluded any trustworthy account, until the visit of Mr. Abel Chapman to a large colony near the mouth of the Guadalquivir. The following is extracted from his narrative published in 'The Ibis' for 1884 (pp. 86–89), with which an illustration of the sitting bird is given from sketches made on the spot:—

"The islands were about six miles distant from the low shores of the 'marisma,' and at that distance no land whatever was in sight. The only relief from the monotony of endless wastes of water were the birds; a shrieking, clamouring crowd hung overhead, while only a few yards off the surface was dotted with troops of Stilts, sedately stalking about, knee-deep. Beyond these the strange forms of hundreds of Flamingoes met one's eye in every direction: some in groups or in dense masses, others with rigidly outstretched neck and legs, flying in short strings or larger flights 'glinting' in the sunlight like a pink cloud. Many pairs of old red birds were observed to be accompanied by a single white (immature) one. On examining narrowly the different herds, there was an obvious dissimilarity in the appearance of certain groups: one or two in particular seemed so much denser than the others; the narrow white line appeared at least three times as thick, and in the centre it looked as if the birds were literally piled upon each other. Felipe suggested that these birds must be at their 'pajarera,' or breeding-place; and after a long ride through rather deep water we found that this was so. On our approach, the cause of the peculiar appearance of the herd from a distance became clearly discernible. Many of the birds were sitting down on a low mud island; some were standing on it, and others, again, were in the water. Thus the different elevations of their bodies formed what had appeared a triple or quadruple line.

"On reaching the spot, we found a perfect mass of nests;

the low mud plateau was crowded with them as thickly as the space permitted. These nests had little or no height: some were raised 2 or 3 inches, a few might be 5 or 6 inches; but the majority were merely circular bulwarks of mud, with the impression of the bird's legs distinctly marked on it. The general aspect of the plateau was not unlike a large table covered with plates. In the centre was a deep hole full of muddy water, which, from the gouged appearance of its sides, appeared to be used as a reservoir for nest-making materials. Scattered all round this main colony were numerous single nests rising out of the water, and evidently built up from the bottom. Here and there two or three or more of these were joined together—'semi-detached,' so to speak; these separate nests rose some 6 or 8 inches above the water-level, and were about 15 inches across. The water was about 12 or 15 inches deep. None of these nests as yet contained eggs; and though I returned to the 'pajarera' on the latest day I was in its neighbourhood (May 11th), they still remained empty. On both occasions many hundreds of Flamingoes were sitting on their nests, and on the 11th we had a good view of them at close quarters. Linked arm and arm with Felipe, and crouching low on the water, to look as little human as possible, we approached within some 70 yards before their sentries showed signs of alarm, and at that distance with the glass observed the sitting birds as distinctly as one need wish. Their long red legs doubled under their bodies, the knees projecting as far as or beyond the tail, and their graceful necks neatly curled away among their back-feathers, like a sitting Swan, with their heads resting on their breasts—all these points were unmistakable. Indeed it is hardly necessary to point out that in the great majority of cases (the nests being hardly raised above the level of the flat mud) no other position was possible.

"Still none of the crowded nests contained a single egg! How strange it is that the Flamingo, a bird which never seems happy unless up to its knees in water, should so long delay the period of incubation; for before eggs could be hatched in these nests and young reared, the water would have entirely disappeared, and the Flamingoes would be left stranded in the midst of a scorching plain of sun-baked mud. Being unable to return to the marisma, I sent Felipe back there on 26th May [1883], when he found eggs; in 1872 I obtained eggs taken on the 24th of May."*

The eggs are two in number, with a white chalky and sometimes rugose surface, beneath which the shell is greenish-blue; average measurements 3·6 by 2·25 in.

The Flamingoes form a distinct Order, related perhaps to the wading *Herodiones*, but with far closer affinities to the swimming *Anseres*. It is therefore not surprising to find that they swim well, and Mr. Blandford states that on one occasion, off the Island of Hormuz, he saw a flock of the present species swimming in the sea at least half a mile from the shore. Mr. Hume remarks that a wounded bird when pursued in deep water carried its neck nearly straight, and bent slightly forward, jerking at every stroke, apparently, of its feet, looking, in fact, as if it was staggering along in water just reaching to its breast. Mr. J. Gatcombe, however, has sent the Editor two sketches taken from life, showing the neck curved in a very Swan-like manner, the whole of the breast being depressed beneath the surface of the water, whilst the hind parts of the body are much raised. In flight the long neck and legs are fully extended, giving the bird a very remarkable appearance. The following graphic description is given by Mr. Chapman:—

"In herds of 300 to 500, several of which are often in sight at once, they stand feeding in the open water, all their heads under, greedily tearing up the grasses and water-plants from the bottom.† On approaching them, which can only be done by extreme caution, their silence is first broken by the sentries, who commence walking away with low croaks; then the hundreds of necks rise at once to the full extent, every bird gaggling its loudest, as they walk obliquely away, looking back over their shoulders as though to take stock of the extent of the danger. Pushing a few yards forward, up they all rise, and a more beautiful sight cannot be imagined than the simultaneous spreading of their crimson wings, flashing against the sky like a gleam of rosy light. In many respects these birds bear a strong resemblance to Geese. Like them, Flamingoes feed by day; and great quantities of grass, &c., are always floating about the muddy water where a herd has been feeding. Their cry is almost undistinguishable from the gaggling of Geese, and they fly in the same catenarian formations."

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* Henke found a colony of more than 400 nests in the Kirghiz steppes, on a sand-bank, where the ground was then dry, but with a different wind the water would sometimes be a foot high round the nests, some of which were raised about 2 feet (Ibis, 1882, p. 227).

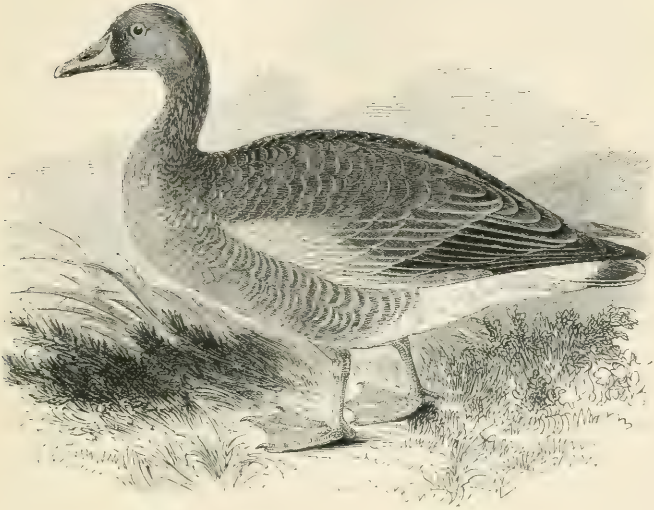
† Flamingoes are stated by Henke to feed their young on frogs, to obtain which they visit a fresh-water lake five-and-twenty miles distant, at night.

Another particular in which the Flamingoes resemble the Geese and Ducks is in their moult, which appears to take place earlier and to be more simultaneous in the males than it is in the females. Würdemann, who describes the running-down and capture of a number of *Ph. ruber* on the Florida Cays, states that out of eight birds selected for skinning, only one proved to be a female.

In the adult the entire plumage except the wings is rosy-white; the quill-feathers black; the upper and under wing-coverts light scarlet, passing into rosy-white on the inner webs; scapulars lanceolate and drooping; iris pale lemon-yellow; bare skin next the eye yellow; bill rosy-red at the base, the terminal portion black; legs and feet pinkish-red, brighter at the tarsal joint.

In the young of the first year the pink is absent, with the exception of a slight trace of it on the wings; the secondaries are irregularly barred with black, and the bill, eyes, and legs are of a dull lead-colour. The nestling is covered with a whitish down, tinged with grey on the upper parts.

In size there is considerable variation, irrespective of sex. Mr. Chapman says that the largest he measured was fully 6 feet 5 inches in length, whilst others (old red birds), barely reached 5 feet. The wing from the carpal joint to the tip averages 16 inches.



ANSER CINEREUS, Meyer.*

THE GREY LAG GOOSE.

Anser ferus.

ANSER, *Brisson*†.—Beak nearly as long as the head, sub-conical, elevated at the base, which is covered with a cere, or skin ; a conspicuous nail at the tip ; under mandible smaller than the upper. Nostrils lateral, placed towards the middle of the beak, pierced anteriorly. Wings large, the second quill longest. Tail of sixteen feathers. Legs under the centre of the body ; the tarsi moderately long ; the hind toe free, articulated upon the tarsus ; the three anterior toes united by a membrane.

THE last Order of Birds which now remains to be considered consists of the Geese, Swans, Ducks, and Mergansers, which are remarkable for their powers of swimming and diving, and are commonly called Water Fowl. From the geographical position, extent, and varied character of the British Islands, the species of this Order are numerous.

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* Taschenb. deutsch. Vögelk. ii. p. 552 (1810).

† Ornithologie, vi. p. 261 (1760).

The first three portions were formerly considered as belonging but to one genus, *Anas*; and hence the family name Anatidæ; but modern systematists have found it desirable to divide them into smaller groups, which are known to be distinct in their characters and habits, and these will be hereafter referred to.

By fowlers Wild Geese are divided into 'Grey' and 'Black' Geese, and under the former four species are included. The Grey Lag Goose, the first on our list, has not always been so well defined or represented as to exhibit the true specific characters that distinguish it from the Bean Goose and White-fronted Goose, with which the Grey Lag Goose is the most frequently confounded. The present species is considered to be the origin from which our valuable domestic race is derived; and to show the aptitude of the wild bird to this purpose, the Author may mention that the Zoological Society of London, possessing a pinioned wild Grey Lag Gander, which had never associated with either Bean Goose or White-fronted Goose, though both were kept on the same water with him, paired with a domestic Goose (selected in the London market from the circumstance of her exhibiting in her plumage the marks which distinguish the true Grey Lag species); a sitting of eight eggs was the consequence, and the offspring were prolific.

At the first exhibition of domestic poultry and water-fowl at the Gardens of the Zoological Society, in the Regent's Park, at the end of May, 1845, there was a fine specimen of the wild Grey Lag Goose, sent from India by Mr. Blyth to Mr. Bartlett, who exhibited the bird. The next coop contained the finest and the heaviest pair of domestic Geese, sent by Mr. Nolan, from Dublin. It was obvious that these domestic birds were derived from the Grey Lag Goose. The pinky flesh-colour of the beak and the white nail; the distribution of the markings of the plumage generally, the large blue grey space on the anterior portion of the wing, the flesh-colour of the legs and feet, and the voice, were alike in both. The half-bred Geese, previously referred to as bred by the Society, were also exactly similar. The Author has resumed the old name of Grey Lag Goose, believing that the term *lag*, as applied to this Goose, is either a modification of the English word *lake*, the Latin *lacus*, or perhaps an abbreviation of the Italian *lago ;* from which latter country it is even probable that we might originally have obtained this our domesticated race.* The *candidus anser* of Lucretius, which, by its cackling, excited the attention of the guard and saved the Roman Capitol, was, perhaps, of the same race as those we possess at the present time; as it must be admitted to be very likely that after the Romans had established themselves in this country, they would introduce many of their own domesticated animals. Horace mentions as a dainty, the liver of a *white* Goose fed on rich figs. Why the domestic Goose derived from a wild *grey* species, should become *white*, the Author is unable to say; but some of those persons who keep Geese state, that all Ganders after a certain age become white. This colour once obtained, there is little or no difficulty in perpetuating it by restriction, and there is a motive for perseverance, as white feathers produce a better price than grey ones.† Domestic Geese are said to be very long-lived; one is recorded to have lived sixty-four years, and was then killed by mistake.

The Author, however, finds some reason to believe that one other species, at least, has had a share in establishing our present domestic race. Almost all the species of Geese, Swans, Ducks, and Mergansers are remarkable for the peculiar form of their organ of voice, or windpipe; and so peculiar as well as permanent is this anatomical character, that in the males of the British species of this family (consisting of about forty), almost all of them, but more particularly the Swans, Ducks, and Mergansers, can be immediately identified by the examination of this organ alone. Figures of these will be hereafter introduced as vignettes to the species to which they belong. In the wild Grey Lag Goose the tube of the windpipe is nearly cylindrical, and this form of trachea the Author has often observed on examination of domestic Geese intended for the table, but he has also frequently found the tube flattened at the lower portion, a character which is constant in the White-fronted Goose, *Anser albifrons*. Again, there are few persons acquainted with the appearance of our domestic Geese who have not observed in many of them the white ring of feathers round the base of the beak extending a little upwards on the forehead, from which *Anser albifrons* derives one of its names: the figure of the White-fronted Goose, the next species here given, exhibits this mark. The breast of the latter is strongly barred with black, and these markings are also found, although less pronounced, in the Grey Lag Goose. The legs of many of our domestic Geese are orange-coloured, like those of the White-fronted Goose, whereas the legs of the wild Grey Lag Geese are of a pale flesh-colour. The white colour of the horny termination of the beak, called the nail, is common to both. The occasional deviation from the natural colour of the plumage of the wild birds to a pure white, which is probably caused by domestication and selection, has been referred to.

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* Prof. Skeat considers that *lag* means late, last, or slow; consequently the Grey Lag Goose is the Grey Goose which in former days *lagged* behind to breed in our fens, when its congeners had betaken themselves to their more northern head-quarters. *Cf.* Ibis, 1870, p. 301.

† White feathers may be partially induced by constant plucking. There are two white varieties of domestic Ducks derived from the Wild Duck, namely, the English Aylesbury Duck and the Dutch Call Duck.

The wild Grey Lag Goose was formerly common in the fens of this country, residing there the whole year, and bringing out eight or nine young; but the general system of draining pursued in Cambridgeshire, Norfolk, and Lincolnshire, has been the means of driving them away. The precise date is not known; but in 'The Zoologist' for 1883 (p. 384), Mr. Harting quotes a letter addressed to the celebrated John Hunter by William Walcot, jun., of Oundle, Northamptonshire, in which the latter says: "To the best of my recollection it was in the summer of 1773 that I took the original Goose (now in my possession) with three others (then very little goslings) in the fens between Cambridge and Ely." Daniel, in his 'Rural Sports' (iii. p. 242), published in 1807, says that he took two broods in one season, which he turned down, after having pinioned them, with the Common Geese; both parties seemed shy at first, but they soon associated, and remained very good friends. Grey Lag Geese have long since ceased to breed in Lincolnshire, and Mr. Cordeaux informs the Editor that they appear to become rarer in the Humber district every year; and further north, along the east coast, the species is almost unknown. On the west side of our island it is also rare; and during his long experience the late Mr. Rodd only knew three instances of its occurrence in Cornwall and the Scilly Islands. Certain it is that now the Grey Lag Goose is comparatively a rare bird at any season, and whole winters pass away without a single example occurring in the London market, though the bird is well known to some who are constantly upon the look-out for it. A few specimens appeared in October 1837, and in January 1838, and the Author considered himself fortunate in obtaining two specimens in March 1840, at the common Wild Goose price, of a poulterer who did not know them as distinct from the Bean Goose. On the south coast of England identified specimens are almost equally rare.

In Scotland, as Mr. Harvie-Brown informs the Editor, this species is perhaps the rarest of the 'Grey' Geese on migration; he only met with it once in Stirlingshire, and never heard of another. It still breeds, however, although in decreasing numbers, in Sutherland, Ross, and Caithness, on the mainland; and, more abundantly, on the islands of the Outer and Inner Hebrides. It is, in fact, the only species of Wild Goose which nests in Scotland, for the statements of Selby as to the breeding of the Bean Goose in Sutherlandshire, and of Macgillivray as to the nesting of the Pink-footed Goose in the Hebrides, have never been confirmed. In bad weather the Grey Lag Goose is an accidental visitor to Orkney and Shetland, but it is not known to breed there.

In Ireland it is, as a rule, rare in a wild state at any season, but Sir R. Payne-Gallwey states that on the lake at Castle Coole (Lord Belmore's), in co. Monaghan, there are over a hundred true Grey Lag Geese which never stray far from this locality on which they have existed and bred for an unknown number of years. He was further told by Mr. A. G. More, of the Dublin Museum, that he had seen about a hundred—herded, not paired—throughout the summer, on a lake near the sea in co. Wicklow (' Fowler in Ireland,' p. 154).

The Grey Lag Goose has been proved to breed in Iceland; but it no longer does so in the Færoes, although it visits them. It is still numerous on the west coast of Norway, and the late Richard Dann, who supplied the Author with interesting notes referring to many of the species of this extensive family of birds, more particularly as to their breeding-ground and habits in Scandinavia, says: "On the inlets and islands from Bergen northwards, these Geese are not uncommon during the summer, particularly about Hitteren, where they are tolerably numerous early in August, and one of our party shot one there, which proved to be a very large gander. Their migration so far north, however, seems to be confined to the coast, for I never met with them in Lapland, or in the northern parts of Sweden or Norway. They make their appearance in the Elbe at the latter end of August or the beginning of September, remaining there until October, and then go further south." This species breeds in Denmark, Sweden, Finland, Russia, and some parts of North Germany; locally in Bohemia; and occasionally in the marshes of the south of Spain. Throughout the rest of Europe it occurs on migration; and in winter it is believed to visit the lakes of North Africa in small numbers. According to Henke and Bogdanow, it breeds in abundance in the deltas of the Volga and the Terek, on the Caspian; and it probably nests in other localities of a similar nature on the borders of Europe and Asia. Its breeding-range does not appear to extend to the northern portions of the latter, but only as far as Turkestan, Kashgharia, Mongolia, and Amurland; and in winter the bird visits China as far south as Shanghai, and is abundant in India down to the Central Provinces*; some species of large Grey Goose, as yet unidentified, has also been observed in Ceylon.

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* Large Asiatic birds, with some white at the base of the bill, more black on the under parts, and less grey on the wing-coverts and rump, have been separated by the name *A. rubrirostris*, Hodgson.

The nest of the Grey Lag Goose is placed on the ground in a tuft of coarse grass, or among rank heather, and is composed of grass, dried flags, &c., without any true lining until the eggs are deposited, after which the sitting female keeps on plucking down from her breast and surrounding them with it. The eggs are usually six in number, but twelve are said to have been found; their colour is a dull yellowish-white, and the average measurements are 3·5 by 2·4 in. In Scotland this Goose is an early breeder, generally hatching out by the middle of May; but in Northern Europe incubation is somewhat later. The males leave the fens when the females begin to sit, and collect in flocks near the water, to which the females conduct their young when they are ready to go.

This species feeds inland, and, unless very much harassed, always by daylight; its aliment consisting of vegetable substances; but at dusk it sometimes resorts to the neighbourhood of the sea, where sand-banks, promontories, and low islands enable it to roost unmolested. The sportsman's term for a flock of Geese is a "gaggle," probably from the noise made by the birds.

The beak is of a pink flesh-colour, the horny nail at the extremity of each mandible white; the irides brown; the head, nape, back of the neck, and the upper part of the back, ash-brown, the latter-named part with lighter-coloured edges; inner portion of the wings, scapulars, and tertials, lead-grey, with broad and lighter grey-coloured margins; upper wing-coverts, and all the feathers on the primary portion of the wing, except the quill-feathers beyond the first three, very light bluish-grey; the three outer quill-feathers also light grey on the upper portion:—the rest dark lead-grey—all with white shafts; the lower part of the back and the rump uniform light bluish-grey; upper tail-coverts white; tail-feathers greyish-brown on the outer webs and white on the inner, with white tips; chin, neck in front, and the breast, of a lighter grey colour than the back of the neck:

the belly, and all the under surface of the body, white ; sides, flanks, and thighs, barred with ash-colour and greyish-white ; under tail-coverts, and the under surface of the tail-feathers, white ; legs, toes, and membranes, dull flesh-colour ; the claws black.

The whole length of an adult male is thirty-five inches ; the wing, from the carpal joint to the end of the second quill-feather, which is the longest, seventeen inches and a half ; the wings when closed scarcely reaching to the end of the tail. Both males and females have a hard callous knob at the point of the wing, which varies in size in the different species of Geese. The males in this genus are larger than the females. An adult female measured thirty inches in the whole length, and sixteen inches in the wing. Mr. Bartlett, who has paid great attention to the plumage of these birds, says, the young of this species are darker than the adults, but the grey colour of the shoulders and rump, the form of the bill, and the colour of the legs and feet, will always distinguish them from the young of any of the other species.

The Grey Lag Goose in a domestic state has produced young by union with the Knobbed, or Swan Goose, *A. cygnoides* ;* also with the Canada Goose, and once with the Bernacle Goose. It has been stated that when a union takes place between two different species of Geese, both having light-coloured legs, or both having black legs, the young are prolific ; but when produced between two birds one of which has light-coloured legs, the other black legs, the young are not prolific.

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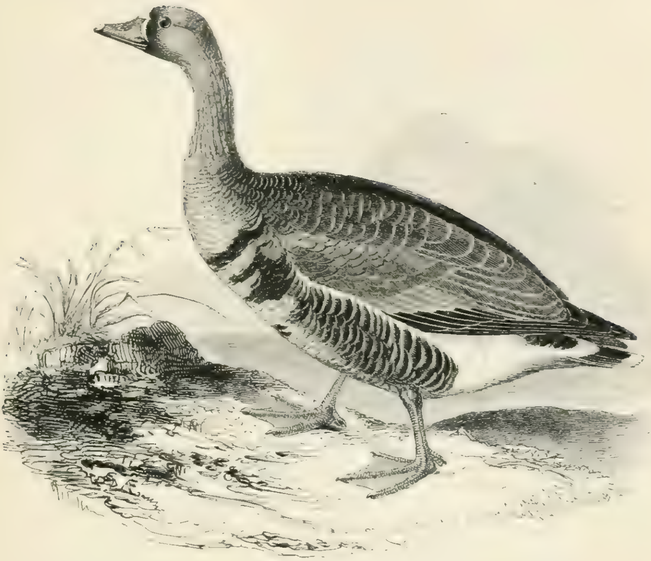
* The Knobbed, Swan, Guinea, Cape, or Chinese Goose—for by all these names is it known—is an introduced species, a native of Central Asia. Both there and in this country it breeds freely in confinement with the domestic species, the hybrids being fertile. From time to time an unpinioned individual escapes, and is duly slain and recorded.



ANSER ALBIFRONS (Scopoli*).

THE WHITE-FRONTED GOOSE,

OR LAUGHING GOOSE.

Anser albifrons.

THE WHITE-FRONTED OR LAUGHING GOOSE may be considered as a regular winter visitor to this country, not usually so numerous as the Bean Goose, but occasionally appearing in very large flocks, and in some proportion to the severity of the weather on the Continent. This species frequents marshes and morasses, rather than corn-fields; and birds examined by Selby were found to have their stomachs filled with the tender shoots and leaves of the common clover. Sometimes these birds are not uncommon in the shops of the London poulterers from November till March, and are in some request for the table as one of the best among the different sorts of Wild Geese. They are not known to remain to breed in any part of this country in their natural wild state; but in June, 1843, a pair in the Gardens of the Zoological Society brought forth their brood from one of the islands in the pond to which they are restricted, and showed great anxiety for the safety of their young. The egg is white, tinged with buff, and measures 2·85 by 1·9 in. This species has also produced a brood by union with a Bernacle Goose, and one of the hybrids was presented to the Gardens in 1844 by Lord Derby.

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* *Branta albifrons*, Scopoli, Ann. I. Hist. Nat. p. 69 (1769).

Large flocks of this species were seen in Cornwall and Devonshire, during the winter of 1829-30, frequenting turnip-fields; and it has frequently been killed in Hampshire, Sussex, Kent, Cambridgeshire, Suffolk, and Norfolk; but in the latter county, according to Mr. Stevenson, it is somewhat local. In Lincolnshire, and along the north-east coast, it does not seem to occur in any great numbers, the common species being the Bean Goose; and on the east side of Scotland it is uncommon, except in Elgin, near the Moray Firth. At long intervals it visits Shetland in large flocks. On the west side it occurs only sparingly in the Outer Hebrides, but in Islay it is the commonest species of 'Grey' Goose, arriving, according to Mr. H. J. Elwes, early in October, and remaining till the middle of April. It has been observed from time to time along the west coast of England, and in Wales; but on the whole it is the most locally distributed of the British species.

To Ireland the White-fronted Goose is a regular winter visitant, being especially abundant in the southern counties; and on the west and north-west it is considered by Mr. R. Warren to be the commonest of the inland-feeding species. During the severe winters of 1879-80, and 1880-81, large numbers were observed, and a good many were shot, on the open fields and inland waters. Sir R. Payne-Gallwey was assured that during the unexampled bitter weather of January 1881, nine of these Geese pitched and fed ravenously on some refuse vegetables in the main street of Tullamore, King's County.

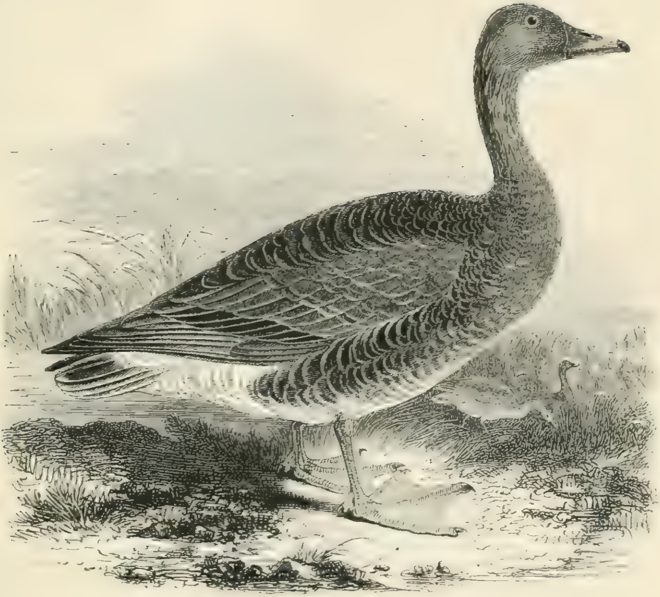
The White-fronted Goose has been observed in the Færoes, and in the southern part of Iceland; and it occurs on the coast of Norway in winter. According to Prof. Malmgren, it visits the central and southern districts of Sweden on migration; but the bird which breeds on the fells of Lapland, and which is known as the 'Mountain Goose,' appears to be the species described by Linnæus under the name of *A. erythropus*, characterized by its smaller size; short, straight-ridged bill forming a line with the forehead, on which the white extends beyond the line of the eye; and somewhat darker plumage. No British-killed example of the latter is known to be in existence, but Mr. Cordeaux informs the Editor that, about ten years since, he saw hanging on a stall in Grimsby market in which only local birds are exposed, an undoubted example of this little Goose, which was unfortunately sold and lost sight of before he could secure it. It is naturally somewhat difficult to trace the respective ranges of such close allies, but, according to Henke, the large White-fronted Goose passes through Archangel on migration, breeding on the Kanin peninsula; and it is common in the Ural. On the Yenesei Mr. Seebohm only obtained the Lesser White-fronted species; but our bird is stated by Von Middendorff to be the commonest species found breeding in the Taimyr district; and it appears to be not unfrequent at Irkutsk. In autumn and winter this Goose visits Northern India, China as far south as Shanghai, and Japan. On migration and in winter it has occurred throughout Europe down to the African side of the Mediterranean basin, vast flocks resorting to the Nile valley; and Dr. Leith Adams states that the White-fronted and also, seemingly, the Grey Lag Geese, were domesticated by the old Egyptians, characteristic delineations in the British Museum, and in the little temple of Amada, in Nubia, showing the steward counting the Geese and Ducks in presence of the owner, to whom their feeders are making obeisance.

In North America there is a White-fronted or Laughing Goose, described and figured by Edwards, from a specimen brought from Hudson's Bay; and to this specific rank has been accorded under the name of *A. gambeli*. So far as the Editor can judge from the series available, the latter is a considerably larger bird, with a great deal more black on the breast, abdomen, and flanks, and much darker under wing-coverts. At present evidence is wanting as to which of the two forms occurs in Greenland; possibly the Old World representative visits the east side, while the American bird may be confined to the west coast of that great peninsula. The range of *A. gambeli* extends across the continent to the Pacific coast, on which it is far more abundant than on the Atlantic, and its southward migrations reach to Mexico, Cuba, and probably to other islands of the Antilles.

In the adult White-fronted Goose the bill is orange-yellow, the nail white; at the base of the upper mandible, and on the forehead, the feathers are white; irides dark brown; head, neck, back, rump, and wings brownish-ash colour; upper wing-coverts greyish-brown, margined with dull white; wing-primaries and secondaries bluish-black; upper tail-coverts white; tail-feathers dark grey tipped with white; breast and belly pale brownish-white, with patches and broad bars of black; sides and flanks ash-brown, edged with dull white; vent and under tail-coverts white; legs, toes, and membranes orange; claws whitish horn-colour.

The average length of an adult is twenty-seven inches; from the carpal joint to the end of the wing sixteen inches.

The plumage of young birds of the year is more uniform in colour and rather darker, the feathers at the base of the upper mandible are of a deeper brown than those of the other parts of the head; the nail and point of the beak light brown. The pale brown feathers on the breast are uniform in colour, without any dark patches or bars.



Anser segetum (Gmelin*).

THE BEAN GOOSE.

Anser segetum.

The Bean Goose, and the Pink-footed Goose next to be considered, may readily be distinguished from the two preceding species by the black "nail" at the tip of the bill, whereas it is white in the Grey Lag and the White-fronted species. Forty years ago, when the first Edition of this work was published, very confused notions were entertained respecting the distribution and comparative abundance of the four species of 'Grey' Geese; and the Bean Goose was said to breed in Westmoreland, the Hebrides, and upon several of the Sutherlandshire lakes. No Wild Goose nests at the present day in

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* *Anas segetum*, Gmelin, Syst. Nat. i. p. 512 (1788).

Westmoreland or any other part of England; and subsequent investigation has shown that Selby was wrong in his identification, and that, as already stated, the Grey Lag Goose is the only species which has ever been proved to breed in Scotland or its islands. The Bean Goose generally visits us from August onwards, and a good many frequent our coasts throughout the winter, a return migration being observable early in the spring. In some seasons, and in certain localities, it is more abundant than its close ally, the Pink-footed Goose; but the balance of evidence, so far as the Editor has been able to sift it, appears to be in favour of the general numerical superiority of the latter. This is the case on the eastern side of England; also, according to Mr. F. S. Mitchell, in Lancashire; but in Cornwall, the late Mr. Rodd has stated that nine-tenths of the flocks of Wild Geese which visit the south-west in hard weather are Bean Geese. In the eastern districts of Scotland the Bean Goose appears to be the predominant species; but to Orkney and Shetland it is only an occasional straggler. In the Outer Hebrides, according to Mr. R. Gray, it is a common winter visitant, remaining on the outlying rocks and islets, especially in the neighbourhood of Harris, as late as the beginning of June.

In Ireland Sir R. Payne-Gallwey says that "it is by far the commonest species, and may be seen in enormous 'gaggles' for six months of every year. It is essentially an inland feeder, on bogs and meadows; but will fly to the mud-banks and slob of the tide at dusk, to pass the night. These Geese frequent every bog and marsh in Ireland which afford food and security from molestation. They are always found inland in large numbers, save in frost, when they fly down to the meadows and soft green reclaimed lands that lie near the tide. A small proportion will, in the wildest weather, frequent the mud-banks to feed and rest. They usually quit their inland haunts at dusk; disliking to remain on land by night, where dogs, men, or cattle may disturb them, and accordingly fly to the estuaries to rest and feed. At first dawn they again wing inland, and pass the day in open, unapproachable ground. They are very abundant in Tipperary, Limerick, Cork, and the midland counties, where they find their food to perfection."

It is difficult to define with accuracy the range of this species in Europe and Asia, owing to the doubt which so often exists as to the correctness of the identification by the recorders. It visits Iceland; breeds in considerable numbers in Norway and Sweden, mostly beyond 64° N. lat.; and also in North Russia, where Messrs. Seebohm and Harvie-Brown found it nesting on the 'tundras' of the Yenesei. At Dvoinik, on 27th of July, the former observed a migratory flock of several hundred old Geese and about as many young, marching like a regiment of soldiers, most of them being in full moult and unable to fly, so that eleven adults and five goslings were secured. Capt. A. H. Markham, R.N., brought back specimens from Novaya Zemlya, where he found this species very abundant in July and August, especially in the Matyushin Shar and on the east coast. Its breeding range extends across northern Siberia to Amurland;* and in winter flocks visit Japan and China, although this species has not yet been identified in India. It occurs in winter in Asia Minor, Palestine, North Africa, and, in varying proportions, throughout the basin of the Mediterranean. Westward it has been known to go to Madeira, and over the Continent of Europe it is generally distributed on passage and in winter. In Picardy it is said to be the most numerous species, and Vieillot mentions that one of the names of this bird throughout France is *Oie des moissons*, or Harvest Goose, from its frequenting corn-fields.

The breeding-habits of the Bean-Goose do not differ materially from those of its congeners: an egg brought from Norway, and given to the Author by the late Mr. Hewitson, was of a dull white, and measured 3·4 by 2·4 in. Eggs produced by the Bean Goose in St. James's Park were a little smaller.

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* The names of *Anser grandis*, *A. middendorffi*, *A. serrirostris*, have been conferred on forms of doubtful specific distinctness. Examples from North-eastern Asia and China have very large bills, and some males in Mr. Seebohm's collection show a tawny colour on the head and neck, like that in *A. cygnoides*, which is found in the same regions.

Mr. Abel Chapman says that in Northumberland this Goose makes its appearance about the middle of October. It feeds entirely inland, and by day; and during severe winters he is accustomed to see them daily, when out in his gunning-punt, flying to the fields of hard-corn and clover-lea at daybreak, returning to the sea coast at dusk. They do not roost afloat, but on an immense expanse of dry sand which is seldom covered even at spring-tides. Selby thinks that our name of Bean Goose has been suggested by the decided partiality of the bird to pulse and grain; and Mr. Harvie-Brown states in corroboration that in Stirlingshire it punishes the farmers' newly-sown beans in early spring.

Sir R. Payne-Gallwey says that he has seen a gaggle of Bean Geese alight, and, after some scrutiny, peck and beat to death a decoy-goose which was entangled in the fastenings by which it was pegged down; also that he has on several occasions seen a sentinel bird relieved of his duties by a companion. He adds that Geese are not very wary at night, nor do they then appear to possess the powers of vision of other wild-fowl. Bean Geese are the slaves of weather; when frost sets in they are driven for sustenance to tidal-waters; continued rain and wind keep them inland; a north wind unsettles them; a north-east wind, again, will bring them to the coast in anticipation of frost; a change, and they are on their travels once more.

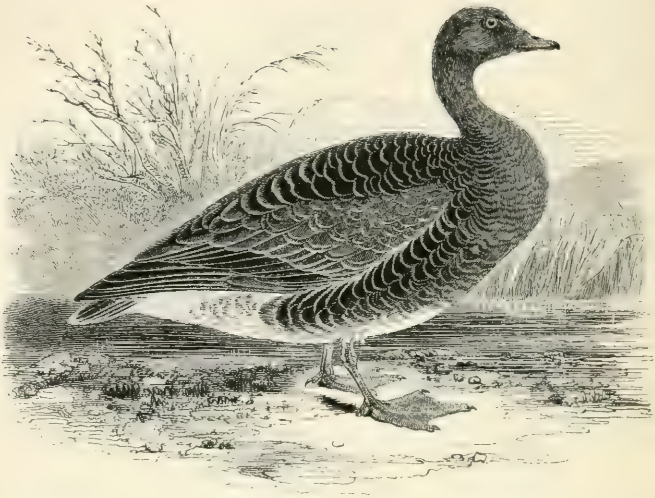
The bill is two inches and a quarter in length, nearly as long as the head; rather slender towards the end, and pointed; the nail, edges, and base, black, the middle portion deep orange; irides dark brown; a few white feathers on the base of the bill; the head and neck, brown, tinged with grey; back and scapulars darker brown, slightly tinged with grey; each feather margined with greyish-white; wing-coverts, secondaries, and tertials, greyish-brown, edged and tipped with white; primaries dark greyish-black; under wing-coverts ash-brown; rump blackish-brown; upper tail-coverts white; tail-feathers ash-brown, broadly edged with greyish-white; neck in front, breast, and belly, dirty white; abdomen, vent, and under tail-coverts, pure white; legs, toes, and membranes, orange; the claws black.

The whole length of an adult male is thirty-four inches. From the carpal joint to the end of the wing nearly nineteen inches; the second quill-feather the longest in the wing; the wings when closed reaching considerably beyond the end of the tail; point of the wing with a prominent callous knob hidden by the plumage.

Young birds of the year are darker in the general colour of their plumage, and the markings less distinct, but with a tinge of tawny colour about the neck.

Two or three young ones were produced in St. James's Park by the union of a Bean Goose with a Pink-footed Goose, next to be described.

Wild Geese, when on the wing together for any distance, are frequently observed to assume some particular figure. If there are only three or four birds, they mostly fly in a straight line one after the other; when more numerous, they assume a wedge-shaped form like the letter < placed horizontally, the angle in advance, the interval between the side lines sometimes occupied.



ANSER BRACHYRHYNCHUS, Baillon.*

THE PINK-FOOTED GOOSE.

Anser brachyrhynchus.

ON the 8th of January, 1839, at the first evening meeting of the Zoological Society in that year, Mr. Bartlett exhibited several species of Geese in illustration of a paper on a new British species of the genus *Anser*, for which he proposed the name of *A. phœnicopus*, on account of the pink colour of the feet; being then unaware that Baillon had previously described the same species in an obscure publication, under the name of *A. brachyrhynchus*, with reference to its short bill. At that time Mr. Bartlett had examined twelve examples: four of them alive; and in pointing out the characteristics of this species and its allies, he remarked that in the formation of its sternum the Pink-footed Goose more closely resembled the White-fronted than the Bean Goose, although so like the latter in external appearance.

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* Mém. Soc. roy. d'émulation d'Abbeville, 1833, p. 74.

The Pink-footed Goose, for the first notice of which, in this country, we are indebted to the discrimination of Mr. Bartlett, is considerably smaller in size than the Bean Goose last described, but is otherwise so like it in general appearance, that there can be no doubt it has frequently been mistaken for the young bird of that species. On comparison it is at once distinguished by the smaller and shorter beak, and the pink colour of the legs and feet; but it may be mentioned that, according to Mr. Cordeaux's experience, the dimensions of the bill in some immature Bean Geese little exceed those in the present species; and again, some true Pink-footed Geese kept in semi-captivity by Mr. Cecil Smith, have produced broods in which one or more individuals occasionally showed orange in their bills and feet, although in the rest of the brood those parts were of the normal pink colour.

Attention having been called to the distinguishing characteristics of the species, it has since been recognized as rivalling the Bean Goose in its abundance during the colder months of the year. Pink-footed Geese were observed to be not uncommon in the London market during the winters of 1838, 1839, and 1840; and in January of the year 1841, the Author was informed by the Hon. and Rev. Thomas Keppel of Warham Rectory, near Holkham, that a Pink-footed Goose had been killed by his nephew, Lord Coke [the present Earl of Leicester], at Holkham. This bird was shot out of a flock of about twenty, but nothing particular was observed in their flight or habits. Subsequent observation has shown that nearly all the Wild Geese which frequent the Holkham and Burnham marshes are of this species; and so abundant are they in severe weather that 138 were killed in the winter of 1860-61. To this species probably belonged the flocks which Lubbock formerly spoke of as Bean Geese. Mr. Dowell informed Mr. Stevenson that they feed on the uplands by day in flocks of from one or two to six or seven hundred; and he has known as many as twenty-seven shot in a day by sportsmen lying-up for them behind gate-posts in the Holkham marshes, in a gale of wind, when the Geese fly low. As regards the Humber district, Mr. Cordeaux informs the Editor that he now believes it to be the commonest of the 'Grey' Geese; Mr. W. Eagle Clarke says the same of the eastern part of Yorkshire, and Mr. Abel Chapman sends a similar report of Northumberland. Mr. Mitchell thinks that on the whole it is the most abundant of the 'Grey' species on the Lancashire coast. It occurs in winter in suitable localities along the eastern side of Scotland, but it has not yet been remarked in Shetland; it is also found on the west side, and in the Hebrides, but John Macgillivray's statement as to its breeding in the latter is now proved to be erroneous. In the south of England its occurrences are less frequent. It is said to have been observed in Ireland, but Mr. A. G. More informs the Editor that he is not, as yet, aware of the existence of an authentic specimen obtained in that island.

The Pink-footed Goose occurs in Iceland, and the late Mr. Proctor several times received birds with the eggs of which they were said to be the parents. It appears to be the only species of 'Grey' Goose found breeding in Spitsbergen; and may perhaps be the Goose of some kind which was observed by Mr. Leigh Smith's party on Franz-Josef Land; but on Novaya Zemlya the only species found by Capt. Markham proved, as already stated, to be the Bean Goose. It occurs in Norway, but assertions that it breeds there have not been absolutely confirmed by Mr. Collett's subsequent experience, although probably correct. Accurate information is scanty respecting its distribution in Sweden, Denmark (where Mr. Elwes identified it in May), Russia, and in fact throughout the greater part of Europe; but examples are known to have been obtained on passage in Holland, Belgium, and France. Authenticated specimens have been obtained in winter in Northern India, but not in Siberia or China, and the bird recorded by Swinhoe under this name from Japan has proved to be *A. erythropus*.

The nest is said to be placed in situations commanding an extensive view, and the male is constantly on the watch to warn his mate of any approaching danger. Messrs. Cocks and Chapman found three pairs with goslings in the yellow downy state at Magdalena Bay, Spitsbergen, on the 29th July, by which date the adults had recovered the use of their wings, being more advanced in their moult than the Brent Geese. The eggs are rather less than those of the Bean Goose, of a pure white colour, and measure 3·15 by 2·25 in.

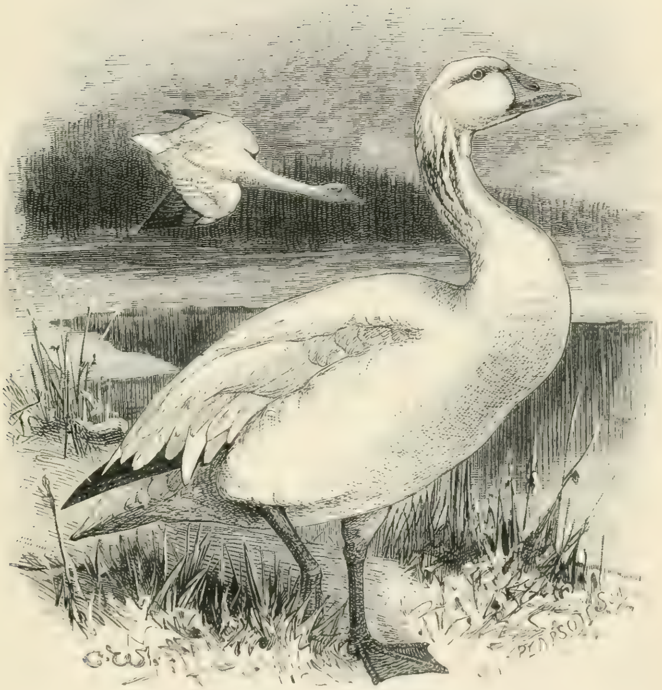
In captivity the Pink-footed Goose is said to keep apart from its congeners. The Zoological Society had a male for several years which never associated with any other birds; and the Ornithological Society had a female which, during the summer of 1840, would not associate with any of the various species kept with her in St. James's Park; yet she laid eight eggs, and began to sit, but of course there were no proceeds. In the wild state, Mr. John Macdonald of North Uist says, that in their habits birds of this species differ from the Grey Lag, with which they do not associate, and he has seen them in parks and enclosures near houses, localities generally avoided by the latter except when tempted by corn or young clover.

The voice of the Pink-footed Goose differs from that of the Bean Goose in being sharper in tone, and the note is also repeated more rapidly.

The bill is but one inch and five-eighths in length, considerably shorter than the head, narrow, and much contracted towards the tip; the nail, and the space from the nostrils to the base black, the intermediate space pink; the irides dark brown; head and neck dark ash-brown, the colour becoming lighter towards the lower part of the neck; back brownish-grey, edged and tipped with dull white; upper wing-coverts bluish-grey; primary quill-feathers lead-grey, with white shafts; the secondaries still darker, almost bluish-black; rump greyish-ash colour; upper tail-coverts white; tail-feathers grey, edged and tipped with white; neck in front, breast, and belly, pale ash-brown, with lighter-coloured edges; sides, flanks, and thighs, grey, broadly tipped with pale brown; vent, under tail-coverts, and under surface of the tail-feathers white; legs, toes, and membranes pink, tinged with vermilion; the claws black; the hind toe short; the membranes of the feet thick and fleshy.

The whole length of the adult is about twenty-eight inches. From the carpal joint to the end of the second quill-feather, which is rather the longest in the wing, seventeen inches and a half; the carpal joint of the wing furnished with the usual hard knob; the wings when closed reach an inch or more beyond the end of the tail.

THE BAR-HEADED GOOSE (*Anser indicus*) is a recently-introduced species, a native of Central Asia and Northern India, which has occasionally escaped from confinement. An example, shot on the banks of the Dee, below Chester, was recorded by Mr. Mather (Zool. p. 5988).



CHEN HYPERBOREUS (Pallas[*]).

THE SNOW GOOSE.

CHEN, *Boie*[†].—Bill shorter than the head, very robust, and higher than broad at the base; the culmen slightly convex, the outline of the lower mandible decidedly so, leaving an elliptical space displaying the lamellæ. Nostrils subbasal. Feathers on the neck less conspicuously furrowed than in true *Anser*. Wings long, full, the second quill-feather the longest. Tail rather short and rounded. Tibia feathered to the joint; tarsus moderately long, reticulate; three anterior toes connected by a membrane; hind toe short and elevated.

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[*] Spicilegia Zoologica, i. pt. 6, p. 25 (1767).

[†] Isis, 1822, p. 563. For an Anserine genus, *Chen* is tolerably defined, and in all the species which compose it, white is the predominating colour.

The Snow Goose was first recorded as a visitor to the British Islands by the Editor, whose attention was called to two immature examples hanging up in Leadenhall Market on the 9th of November, 1871. Subsequent investigation, in which the Editor was assisted by Sir Victor Brooke, showed conclusively that these two birds had been shot a few days before, on the lake of Tacumshane, on the south coast of co. Wexford, and a third was soon after shot in Wexford harbour but not preserved (P. Z. S. 1872, p. 519). One of these passed into the collection of the late Mr. G. Dawson Rowley; the other is in that of Mr. Dresser.

In ‘The Zoologist’ for 1878 (p. 419), Mr. J. E. Harting quoted the following letter from Mr. J. R. Crampton, of Belmullet, co. Mayo :—“A flock of seven Snow Geese were seen on marshy ground in Termoncarra, in the Barony of Erris, about the end of October last [1877]. One of them was shot, and a second, a gander, trapped. After a time the latter was placed with some tame Geese, and soon fraternized with them. He has now (Aug. 26th) got quite tame, and may be seen leading a party of three dozen of his domesticated relatives, who follow him wherever he goes.” Subsequently Mr. Harting was informed (Zool. 1881, p. 308) that this bird, after slaying a rival in fair fight, had paired with one of the Common Geese, and assisted to rear a family of goslings. This bird having since died, its stuffed remains were examined by the Editor during a recent visit to Dublin, and the illustration at the head of the present article is taken from a sketch made by Mr. Whymper. Being a gander, and adult at the time of its death, its measurements somewhat exceed those of the two immature birds obtained near Wexford.

There appears to be some evidence that the above may not, after all, be the earliest known occurrences of the Snow Goose in Ireland. Two birds of this species were in the aviary of the thirteenth Earl of Derby at Knowsley, and at his death were sold by public auction, in August 1851, to Mr. Castang of Leadenhall Market. The latter informed Mr. Bidwell (Zool. 1878, p. 453) that he gave £5 for the pair; and was consequently joked at by the late Mr. John Thompson, the superintendent of Lord Derby's menagerie, who said that he had purchased three of them while travelling in Ireland, out of a flock of Common Geese running on a green.

The Snow Goose has not yet been obtained in Scotland or England, but the Editor has been informed by the Rev. H. A. Macpherson that a bird of this species was observed by himself and others during the early part of the autumn of 1884 on the coast of Cumberland. The 'Cream-coloured Goose' figured by Meyer in his "British Birds" is evidently a mere albino, the primaries being of a creamy-white like the rest of the body, whereas they are black in the present species.

The true home of the Snow Goose is in the Nearctic region; and Messrs. Baird, Brewer, and Ridgway, in their 'Birds of North America,' write as follows:—"There can be little question that two forms of the Snow Goose exist in North America, distinguished by their size and also their geographical distribution. The smaller, to which the name *hyperboreus* properly belongs, and of which *albatus*, Cassin, is a pure synonym, occurs throughout the north-western portions of the continent (being the only one known to breed in Alaska), and in winter migrates over the whole of the country from the Pacific coast to the Mississippi valley. The other, with larger general size and disproportionately heavier bill, breeds in the region about Hudson's Bay, and in winter migrates southward, chiefly along the Atlantic coast. This bird is the *Anas nivalis* of Forster (1772), and if it is to be recognized as a race, as we think it ought, it should be called *Chen* (or *Anser*) *hyperboreus nivalis*." It is clear that the race obtained in the British Islands is the smaller one; but as it is impossible to say to which form are to be attributed the Snow Geese recorded from time to time in the Old World under the name of *Anser hyperboreus*, the Editor must treat them under one name in the following sketch of their distribution.

Mr. Gätke reports from Heligoland that on the 19th May, 1880, three Snow Geese passed the boat quite close, "whiter than snow, bills and feet redder than oranges, but, alas! no gun at hand"; and on the 25th December, "one on cliff, not shot, no doubt about it" (Migr. Rep. pp. 29, 58).

In Europe the Snow Goose is said to have occurred at intervals in Germany, especially in Silesia, in considerable flocks. In the south of France an immature bird is stated to have been killed near Arles; and M. Lacroix has recorded the acquisition of one captured on the 13th of December, 1870, out of a band of three, in the Haute-Garonne, where five or six others were seen. Both Von der Mühle and Lindermayer state that this species has been observed in Greece. In Russia Mr. Sabanäeff states, on the authority of sportsmen, that it is found in the Kaslinsky Ural on migration; and Pallas says that it was met with near Cheli-Uba. It is found about the delta of the Lena and in other parts of north-eastern Siberia, and in Kamschatka; and in winter considerable flocks visit Japan, where the species is known by the name of *Haku-gan;* the specimens which the Editor has examined belonging to the smaller of the two races. On the Pacific coast of America this bird is more or less abundant from Alaska to Southern California; and both the large and the small forms occur in great numbers throughout the interior of the continent on all the lakes as far as Hudson's Bay, and the west side of Davis Straits; migrating southwards on the Atlantic side as far as Texas and Cuba, with occasional visits to the Bermudas. According to Reinhardt, a few stragglers in immature plumage have been observed in Greenland.

Mr. MacFarlane describes the Snow Geese as being very numerous at Fort Anderson about the 25th of May, flying northwards, but being afterwards driven back by the severity of the weather. The nests, which were discovered on a small island in a lake near Liverpool Bay (70° N., 128° W.), were in holes on the sandy soil, and were well lined with down. The egg is said to be large as compared to the size of the bird; oval in shape, the two ends being of unequal size; the colour a uniform dirty chalky white; average measurements 3·4 by 2·2 in. The late Capt. Lyon, of H.M.S. 'Hecla,' says that the eggs are usually five in number.

Richardson says that the young fly in the middle of August, and by the end of September have all departed south. Their food in the summer consists of rushes and insects, and in autumn of berries, particularly of those of the *Empetrum nigrum*. When in good condition these birds are excellent eating, and form the staple article of food for the natives, by whom they are known as the 'Wevois' or 'Wavies.' It is said that the young do not attain to the full plumage of the adults before their fourth year; and until then they keep in separate flocks. At Fort Albany, in the southern portion of Hudson's Bay, where the old birds were rarely seen, the young occurred in abundance; and, on the other hand, the old birds in their migrations visit York Factory in great numbers, but always unaccompanied by their young. On the whole this species is probably the most numerous of all the Geese which inhabit North America.

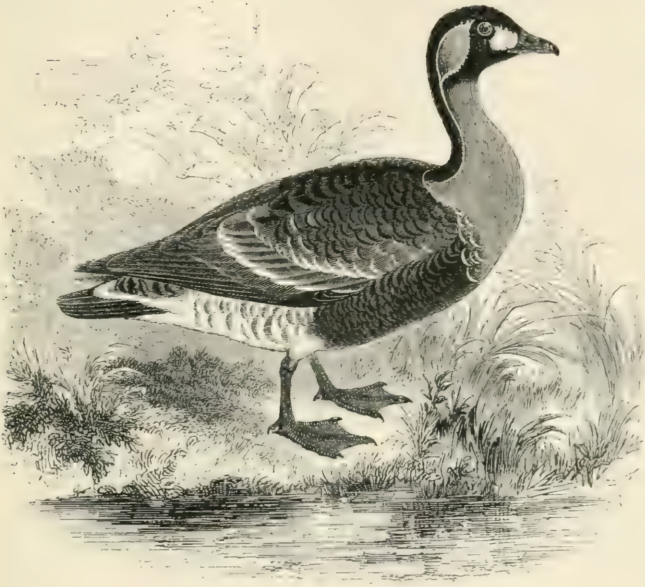
In addition to the two forms which have here been treated as constituting one species, there is a very small and distinct species of Snow Goose, *Chen rossi*, resembling the above in coloration, but with numerous caruncules at the base of the bill. There is also another member of the same genus, known as the Blue-winged Goose, *C. cærulescens*, resembling *C. hyperboreus* in form and proportion, but differing from it in having the upper part of the neck and some of the under parts marked with brown and lead-colour. It is certainly not, in the ordinary sense of words, an immature phase of the Snow Goose, for the young of each have a recognizably distinct plumage; but, considering the irregularity in the disposition of the dark markings on the Blue-winged Goose, it has been suggested that this and the Snow Goose may be, respectively, coloured and white phases of the same species, like those which exist in some of the American Herons. Examples of both these Geese are at the present time (December 1884) living in the Zoological Society's Gardens.

In the adult Snow Goose the entire plumage, except the primaries, is snow white, the forehead sometimes stained with orange-rust colour; primary quill-feathers black, fading at the base into greyish; the coverts of the latter colour. Bill red, the nail whitish, space between the commissures black; iris dark brown; legs and feet purple- or orange-red, the soles dingy yellowish.

The young is dull brownish-grey on the upper parts, the face white, the feathers on the scapular tipped and margined with whitish; quills black, fading to grey at the base, the shafts white, shading to brown towards the tips; rump and upper tail-coverts white; tail white, the central feathers marked grey in the middle; under parts white, washed with grey on the fore part of the breast and neck; bill nearly black, with a reddish tinge, especially on the lower mandible; legs and feet lead-colour, running to yellowish-red on the webs; iris brown.

Total length about thirty inches; wing from fifteen to eighteen and a half inches; culmen from two to two and a half inches; tarsus from two and three quarters to three and a quarter inches. The female is smaller than the male.

The young bird in the downy stage is as yet unknown.



Bernicla ruficollis (Pallas*).

THE RED-BREASTED GOOSE.

Anser ruficollis.

Bernicla, *Boie* †.—Bill much shorter than the head, sub-conical, higher than broad at the base, narrowing to the end; unguis, broadly ovate; edges of the bill nearly straight, scarcely showing the margins of the lamellæ; nostrils oval, placed in the anterior portion of the nasal depression, near the centre of the bill. Feathers on the neck narrow, blended. Wings large, the second quill usually the longest. Tail short, rounded. Legs short, stout; the tarsus reticulate; the three anterior toes long, united by a membrane, hind toe small, elevated; claws small, that on the middle toe broadly rounded.

This beautiful species is an inhabitant of Siberia, and occasionally wanders on migration as far as the British

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[*] *Anser ruficollis*, Pallas, Spicil. Zool. vi. p. 21, tav. v. (1769).

[†] Isis, 1822, p. 563. This genus has been generally allowed to include the present species, and the Editor accepts the arrangement to avoid the multiplication of genera, but he does not consider it at all satisfactory.

Islands. The first recorded occurrence appears to be that of the bird obtained by Marmaduke Tunstall, figured by Bewick, and now preserved in the Museum of Newcastle-on-Tyne. According to Tunstall's MS., as quoted by Mr. G. T. Fox (Synops. Newcastle Mus.) "it was shot in the severe frost in the beginning of the year 1776, near London." He continues:—"Never heard, I think, but of two more seen in England. One was taken alive in this neighbourhood [Wycliffe, in the north of Yorkshire], and is still living. It is kept in a pond with some ducks of the wild breed, with which it is very sociable, but never produced any breed together, although there is one it particularly associates with, and seems to be partial to. It is very tame and familiar." Latham adds that this bird lived until 1785, when it lost its life by an accident. One killed near Berwick-upon-Tweed in 1818 formed part of Mr. Bullock's celebrated collection; and having been purchased by Leach for £27, is now preserved in the British Museum. The authors of the Catalogue of Norfolk and Suffolk Birds make the bare statement that the late Mr. Lilly Wigg bought a specimen of this rare Goose which was killed at Halvergate in Norfolk, in the year 1805, and proceeded to eat it, remarking that its flesh was well-flavoured! One or more specimens are stated by Stephens to have been killed in Cambridgeshire during the severe winter of 1813. Dr. Edward Moore, in his Catalogue of the Birds of Devonshire, has recorded two instances of this Goose having been obtained in that county; one of them shot on Kenton Warren in 1828, in the possession of Mr. W. Russell, at Dawlish; the second killed on Teign marshes, February 1st, 1837, by Rendell of Buckland, and was prepared and preserved by Mr. Drew. In Durham it has been stated by Mr. Hogg that two were seen on the Tees, and one shot in Cowpen Marsh about 1845 (Zool. p. 1178), but Mr. J. H. Gurney, jun., is sceptical on this point. A fine example now in the collection of Mr. John Marshall of Taunton, was killed at Maldon in Essex on the 6th of January, 1871 (Zool. s.s. p. 2513). In Lancashire, two are recorded as having been obtained, but not preserved, near Garstang in 1872

(Zool. s.s. p. 3236). In Scotland, in addition to the Berwickshire one already mentioned, a specimen is stated by Mr. R. Gray to have been killed in the county of Caithness, and to be still preserved in the collection formerly belonging to the late Mr. Sinclair of Wick; and Macgillivray received information that one had been seen on the loch of Strathbeg, some years prior to 1852. As regards Ireland, Thompson states that he was informed by a person to whom the species was well known, that about the year 1828 he had seen a specimen in the shop of Mr. Glennon, to whom the bird had been sent in a fresh state to be preserved. It may be noted for what it is worth, that in the sale-catalogue of the collection of the late Dr. Martin Barry, one of the lots is a "Red-breasted Goose, shot at Kilkerrin Bay, Galway, in 1828."

The Red-breasted Goose is only a rare straggler to Sweden, Denmark, and Northern Germany, but it has more frequently, at long intervals, been met with in Holland; the last time so recently as the 18th of February, 1881.* Five or six examples have been obtained in France, and two or three in Italy. In Russia it is said to visit Archangel in spring, and to have occurred near Moscow; passes through the central provinces in small numbers; is not uncommon on migration near Astrachan; and in winter it visits the southern shores of the Caspian, especially the Persian territory, in considerable numbers. Ménétries relates, in his 'Catalogue raisonné des objets de zoologie recueillis dans un Voyage au Caucase, &c,' that in 1828 a large flock of this species appeared at Lenkoran, probably driven there by strong winds; they were so exhausted by fatigue that they were caught by hand, and many were still preserved in captivity, to which they were easily reconciled. They always kept together, and uttered a gentle call-note when any one of their party separated from the others, or when a bird of prey hovered over them: this was the only sound that he heard them utter. They preferred green vegetables to grain, and used to drink frequently.

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* J. H. Gurney, jun., in 'The Ibis,' 1881, p. 495. The bird was shot, when in company with a lot of Bernacle Geese, by Messrs. W. B. Monement and G. Cresswell, and the description given by the former is worth quoting, in order to show how a very rare bird may be obtained by the merest accident:—"We found the Geese in a long line and thin, so let them swim on in order to rake them; but they would not have it, and rose. We stopped twenty-five Bernacle; got twenty-three and the Red-breasted Goose."

Dr. Severtzoff describes this Goose as rare in Turkestan. At Obdorsk, at the mouth of the Ob, Dr. O. Finsch says that it is by no means uncommon; and on the 1st of July Mr. Seebohm obtained a bird shot from two eggs on an island in $70\frac{1}{2}^{\circ}$. N. lat. in the Yenesei, near which he afterwards saw several birds with their broods on the banks of the river. According to Von Middendorff, it breeds commonly at the mouth of the Pasina, and he obtained and figured the first authenticated eggs on record on the Boganida. Blyth considered it probable that a Goose shot at Nagpore, out of a flock of four, belonged to this species.

The winter migrations of the Red-breasted Goose sometimes extend to the northern portions of Africa. Specimens said to have been obtained in Algeria have recently been offered for sale; and in Lord Lilford's collection there is a specimen labelled by the late Mr. S. Stafford Allen, "Alexandria, December 2nd, 1874." This beautiful species was evidently known to the ancient Egyptians, for several excellent authorities have stated that the Museum of the late Mariette Bey at Boulak, contains a slab obtained at Meydoun, on which are portrayed two Red-breasted Geese, together with two of the White-fronted, and two of some larger species. Mr. J. H. Gurney, jun., says that these portraits are the best executed, and by far the most life-like of any bird-pictures that he saw in Egypt; and are probably the oldest delineations in existence, their age being supposed to exceed that of the Pyramids. The Editor has consulted the woodcut illustrative of this slab in Loftie's 'Ride in Egypt' (p. 209), and finds its accuracy beyond question.

Little is known of the nesting of this species. An egg obtained by Mr. Seebohm is of a dull creamy-white, and measures 2·7 by 1·8 in.

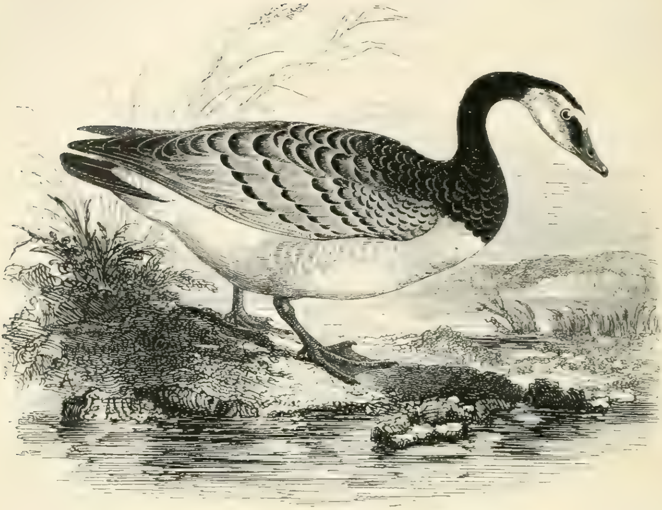
A female of this species obtained in exchange from Holland in 1858 ('List of Animals,' p. 419), lived many years in the Gardens of the Zoological Society, and paired with a male Brent, but did not actually breed (P. Z. S. 1880, p. 502). This beautiful and tame bird was killed by a savage Swan in 1870. Its remains are preserved in the British Museum; and its plumage is fully equal in beauty to that of the finest male bird, thus clearly proving that externally the sexes are alike; a fact which has been doubted.

In the adult bird the beak and the nail are almost black; the irides hazel; between the beak and the eye a white patch; round the eye, the top of the head, and down the back of the neck, black; on the ear-coverts an angular patch of chestnut surrounded with white, ending in a white streak passing downwards; upper surface of the body and wings very dark brown, almost black; wing-coverts edged with greyish-white; upper tail-coverts white; primaries black, the first about equal in length to the second, and longer than the third; tail-feathers black; throat black; neck and upper part of the breast rich chestnut red, ending with a collar of white: lower part of the breast black; belly, vent, and under tail-coverts white; the flanks barred with black; legs, toes, and their membranes, dark brown, almost black.

The whole length twenty-one or twenty-two inches. From the carpal joint to the end of the wing fourteen inches.

In the immature bird the auricular patch is whitish with some rufous-brown in the centre; the chest is merely tinged with reddish; and the rest of the upper and under parts are dusky-brown, except the abdomen and tail-coverts, which are white.

ANSERES. *ANATIDÆ.*



BERNICLA LEUCOPSIS (Bechstein*).

THE BERNACLE GOOSE.

Anser leucopsis.

THE BERNACLE GOOSE is a winter visitor to the British Islands, appearing in considerable flocks, particularly when the weather is severe, and is considered to be more abundant on the western coasts than on those of the east. It has been so frequently confounded with its far commoner relative the Brent Goose, that it is somewhat difficult to sketch its distribution; but from the statements of Messrs. Stevenson, J. H. Gurney, jun., J. Cordeaux, and W. Eagle Clarke, it appears to be a distinctly rare visitor—and only when the winters are very severe on the Continent—to the coasts of Norfolk, Lincolnshire, and Yorkshire. In Northumberland examples were obtained in 1855 and in November 1866, near Holy Island; but Mr. Abel Chapman, who has had subsequent experience of that locality, informs the Editor that he has never met with it. Nor does it seem to be a frequent visitor to the east coast of Scotland, and in Shetland Saxby only observed it once: at Balta Sound, in July 1854. On the west side it is much more abundant, and, according to Mr. R. Gray, it is a regular winter visitor to certain favourite and suitable feeding-grounds in the Inner Hebrides. Mr. Elwes states that large flocks annually frequent Islay throughout the winter, being partial to an island near Ardnave, where they find plenty of grass. They are not so shy as the Grey Geese, and both when feeding and when on the wing they keep up a constant cackling, whereas the Grey Geese usually feed in silence. The Bernacle Goose visits the coasts of Cumberland; and in Lancashire, according to Mr. F. S. Mitchell, it is a regular winter visitor, occasionally seen inland, and in severe weather sometimes appearing on the coast in considerable numbers. It has been obtained on the coast of Wales; and small parties are stated by Rodd to appear in Cornwall now and then in severe winters. On the south coast it is decidedly uncommon, although examples have been recorded from time to time in Devonshire, Dorsetshire, Sussex, Kent, and probably the entire littoral; also occasionally in some of the inland counties.

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* *Anser leucopsis*, Bechstein, Orn. Taschenb. ii. p. 424 (1803).

In Ireland the Bernacle Goose appears to be very local in its distribution; and, according to Sir R. Payne-Gallwey, it is comparatively rare in the south, but more common in the north, north-west, and Dundalk Strand and Lurgan Green, on the east. In many places the Brent Goose is misnamed the Bernacle, but where they are distinguished the present species is known as the 'White-fronted' or 'Land' Bernacle.

This Goose is only a rare straggler to the Færoes; and although Faber says that it inhabits Iceland from April to October, it has not yet been proved to breed there. The last remark also applies to Greenland, to some portions of which it is a regular autumnal visitor, and Graah records it from the east coast of that peninsula. Its occurrence on the western side of Spitsbergen has been doubted, but the Rev. A. E. Eaton states (Zool. s.s. p. 3815), that on his visit to the northern part of that island with Mr. Leigh Smith, he and his party obtained seven examples out of a dozen or more, on a small lake in the hills, opposite Diana Island. There does not appear any evidence that this species has been found in Novaya Zemlya. Mr. Collett is satisfied that a pair of Bernacle Geese for some years past bred on Borgevær, one of the most northern of the Lofoten Islands, off the coast of Norway; and the bird certainly visits that country, Sweden, and Denmark, on migration. In winter it occurs sparingly on the northern coasts of Europe, straggling as far south as the mouth of the Guadalquivir in Spain, and Foggia in Italy. It does not seem abundant in the north of Russia, but, according to Sabanäeff, large numbers visit the Ural on migration. Little is known of its distribution in Siberia; Mr. Seebohm did not meet with it on the Yenesei; nor did Von Middendorff observe it on his visit to the Taimyr. To the east side of North America it is a very rare straggler, and out of four occurrences, only one specimen, which was obtained by Mr. B. R. Ross at the southern end of Hudson's Bay, is free from the suspicion of having escaped from confinement.

In captivity Bernacle Geese soon become as familiar as our domestic species, and have lived a very long time in confinement: in one instance as much as thirty-two years. As already stated, a Bernacle Goose has paired with a White-fronted Goose, and a brood was hatched out.

A small flock of Bernacles, consisting of one gander and four geese, were kept for several seasons in St. James's Park, and young ones were produced in the years 1844 and 45. In the Zoological Gardens a brood was hatched on the 23rd of May, 1848, and other instances of its breeding are on record. Mr. R. Lloyd Patterson states that a pair kept near Belfast, reared several broods, and although the young were not pinioned, they did not desert the place. The eggs laid in confinement were white, and measured 2·75 by 1·9 in. The pair of birds already mentioned as breeding at Borgevær, made a nest early in May, composed of moss and straws, sometimes on the narrow ledges of the rocks, and sometimes in a sheltered locality under stones, or isolated rocky masses, the full complement of eggs being five.

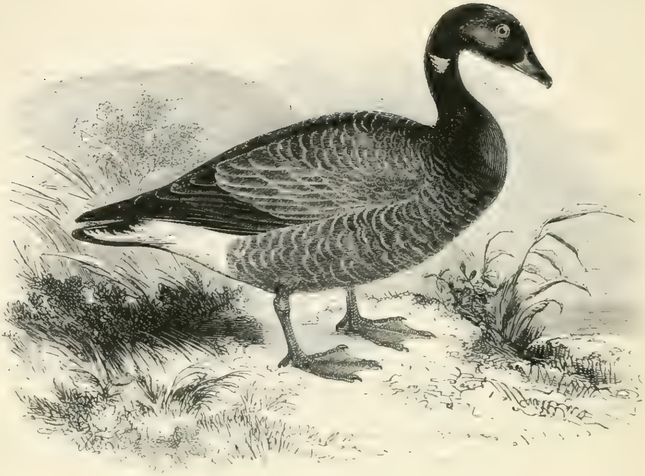
The food of this Goose is grass, and the bents which grow on the sandhills near the coast. Mr. C. M. Adamson states that his captive birds, which refused worms at other times, would eat them in March, and in winter they were partial to the 'London Pride' in the garden, cropping it close to the ground.

To this species, and also to the Brent, the old fable referred, in which the birds were said to be hatched from bernacles (*Lepadidæ*), attached to logs of wood floating in the sea, as described by Gerard in his 'Herbal.' Sir R. Moray, in a paper deemed worthy of publication by the Royal Society in 1678, describes the perfectly-formed miniature Geese which he himself had found in the shells.

This prettily-marked Goose has the beak, and a stripe from the beak to the eye, black; the length of the beak one inch and three-eighths; the irides dark brown; the forehead, cheeks, and chin, white; top of the head, nape, all the neck and interscapulars, black; scapulars, point of the wing, both sets of wing-coverts, and tertials, lavender-grey, tipped with a crescent of bluish-black, and an extreme edge of white; primaries almost black; rump bluish-black; upper tail-coverts white; tail-feathers almost black; breast and belly greyish-white; vent and under tail-coverts pure white; flanks and thighs tinged with grey in bars; legs, toes, membranes, and claws black.

The whole length of an adult male twenty-five inches. From the blunt spur at the carpal joint to the end of the first quill-feather, which is the longest in the wing, sixteen inches.

Young birds have the white of the cheeks varied with black feathers; the ends of the feathers on the back and wing-coverts tinged with rufous; the flanks barred with darker grey, and the legs less decidedly black.



BERNICLA BRENTA (Pallas*).

THE BRENT GOOSE.

Anser torquatus.

OF the various species of Geese that visit the British Islands, this is the smallest as well as the most numerous, and possesses also for us the agreeable advantage of being a good bird for the table. It is a regular winter visitor to the shores of most of our maritime counties, and remains with us through all the cold months of the year, particularly on the east and south coast. It is seldom seen on fresh water in the interior, unless wounded; but is truly a marine species, passing a great portion of the day and night out at sea, at other times frequenting extensive muddy flats and sand bars on the sea-shore, which are exposed at every ebb tide. The birds make their appearance at these their feeding-places as soon as, or even a short time before, the water leaves the ground exposed, remaining there, if undisturbed, till the tide flows over the ground again. In such situations the large flocks that frequent certain favourite localities are quite extraordinary.

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* *Anser brenta*, Pallas, Zoogr. Rosso-As. ii. p. 229 (1811).

Upon the Northumbrian coast, Selby observes that, "a very large body of these birds annually resorts to the extensive muddy and sandy flats that lie between the mainland and Holy Island, and which are covered by every flow of the tide. This part of the coast appears to have been a favourite resort of these birds from time immemorial, where they have always received the name of *Ware Geese*, given to them, without doubt, in consequence of their food consisting entirely of marine vegetables. This I have frequently verified by dissection; finding the gizzard filled with the leaves and stems of a species of grass that grows abundantly in the shallow pools left by the tide, and with the remains of the fronds of different algæ, particularly of one, which seems to be the Laver (*Ulva latissima*). In this haunt they remain till the end of February, when they migrate in successive flocks, as the individuals happen to be influenced by the season, and before April the whole have disappeared. When they depart the same procedure as that mentioned by Wilson, in his American Ornithology, takes place; the flock about to migrate rises high into the air by an extensive spiral course, and then moves off seaward in a northerly direction."

In Scotland this species is common on the east side, but on the west coast and islands it is said by Mr. R. Gray to be less abundant and less regular in its visits than the Bernacle. It comes to the Shetlands in autumn, but Saxby considers it too scarce there to have received the local name of 'Horra Goose,' by which it is said to be known in the Orkneys. With these exceptions the Brent Goose is found in abundance during winter in suitable localities, round the coasts of Great Britain; and vast numbers occur in many places on the shores of Ireland.

On migration the Brent Goose visits the Færoes, the coasts of Scandinavia, and the shores of Europe generally, down to the African and the Asiatic sides of the basin of the Mediterranean; but in the extreme south its occurrences are irregular, as they also are to the inland waters of the Continent. It appears not improbable that it breeds sparingly in some parts of Iceland; and it certainly does so in immense numbers on Spitsbergen and the neighbouring islands, Novaya Zemlya, the coasts and islands of Arctic Siberia, and the land to the north as far as man has yet penetrated. Returning westward, its breeding range can be traced to Greenland beyond 73° N. lat.; and thence, throughout the shores and islands of the Arctic Sea, as far as 82° 30′ N., where Major Feilden of H.M.S. 'Alert' found its nest. In winter it descends the Atlantic seaboard as far as Long Island, New York; sometimes extending its migrations to Florida and Texas. On the Pacific side it is replaced by a closely-allied species, *B. nigricans,* in which the white on the middle of the neck forms an almost complete collar, and the black of the jugulum extends over the breast, fading slightly into dark brown on the abdomen. This latter species visits Japan.

The nest of the Brent Goose is described by Major Feilden as being placed upon the slopes of the hills between the line of snow and the sea-ice; it is composed of a good foundation of grass, moss, and stems of saxifrages, with a warm bed of down, in which the eggs, usually four in number, are deposited. The latter are creamy-white in colour, smooth in surface of shell, their average measurements being 2·8 by 1·8 in. The male generally remained near his mate; and in one instance, after Major Feilden had shot the female off her nest, the gander came hissing at him with head bent down and neck close to the ground, in the same manner as our domestic birds resent intrusion on their premises. Both sexes are described as being most assiduous in taking care of their young.

By the end of July, or early in August, the old birds are unable to fly, owing to the moult of their quill-feathers, and under these circumstances considerable numbers are sometimes killed, although not without trouble, for they can run with great speed. They rarely dive, except when wounded, and then only to a limited extent. When searching for food in shallow places the head and neck are extended below the surface; and the black line of the assembled multitudes on our coasts is then seen to be broken and dotted by the raised white 'sterns' of the feeding birds. Aquatic plants and seaweeds, especially *Zostera marina*, with small crustaceans and marine insects, form their principal nutriment; and from their habit of searching for the former, their northern names 'Rotgaus,' 'Road Goose,' *i.e.*, 'Root Goose,' appear to have had their origin.

The call of this species is a loud 'cronk,' or 'honk,' which can be heard several miles away. Hawker, Wilson, Sheppard and Whitear, Thompson, and others, have testified to its resemblance to the sound of a pack of hounds in full cry; and the last-named ornithologist describes the excitement of a horse he was riding on being evidently deceived by the distant notes of a 'gaggle' of some 500 Brents.

So far as the Editor can judge from the scanty series with accurately assigned localities, available for comparison, there are two forms of this species which visit our shores; the one with the underparts somewhat light-coloured, from the Atlantic; and one with a darker breast and abdomen from Novaya Zemlya, and perhaps Arctic Siberia; the latter is not, however, to be confounded with *B. nigricans* of Alaska. The darker form appears to be the prevailing one on our east coast; but Mr. Cordeaux informs the Editor that in the winter of 1880–81 there was an unusual number of the light-bellied birds in the Humber district.

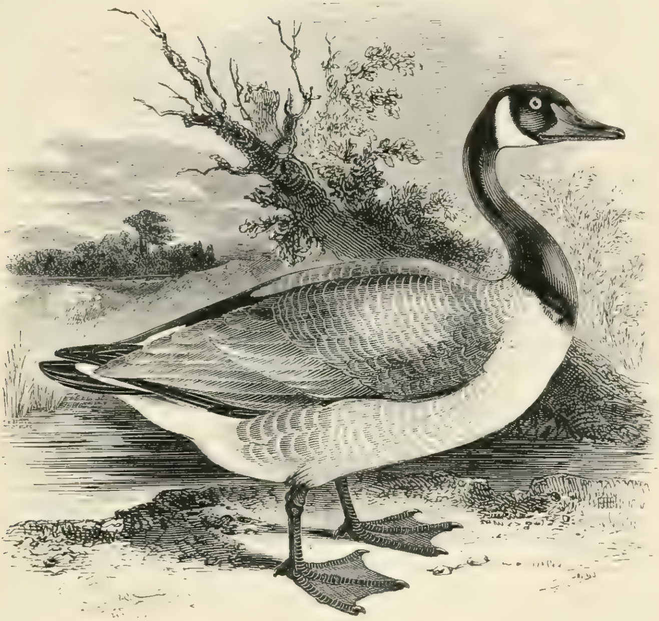
In the adult male the bill is black, and only one inch and a half in length; the irides very dark brown, almost black; the forehead low, the head small and black; the neck all round black, except a small patch on each side, which is white, but mixed with a few regularly-placed black feathers; back, scapulars, wing-coverts, and tertials, dark brownish-black, the edges a little lighter in colour; primary and secondary quill-feathers black; the rump black; upper tail-coverts white; tail-feathers black; upper part of the breast black; lower portion of the breast and the belly slate-grey, with lighter-coloured margins; vent and under tail-coverts white; legs, toes, membranes, and claws black, with an olive-green tinge upon the tarsal joint and the upper surface of the toes. A description of a curious variety of this species, with reddish legs, was furnished to Mr. H. Stevenson by Mr. F. Norgate (Zool. 1882, p. 366).

The whole length twenty-one inches. From the carpal joint to the end of the wing thirteen inches; the first and second quill-feathers about equal, and the longest in the wing. Females are a little smaller than males.

Young birds of the year have little or no white patch on the sides of the neck; head and neck dusky lead-grey; the feathers of the body edged with brown; belly and flanks grey, of varying shades.

The downy nestling was first figured and described by Von Middendorff. One obtained by Capt. A. H. Markham, R.N., in Novaya Zemlya, in July 1876, is greyish-white on the underparts, brownish-grey above, with lores and crown of a darker tint.

There does not appear to be any authentic record of the breeding of the Brent Goose in captivity, although this species, as well as the Bernacle, are mentioned by Willughby as inmates of St. James's Park in the time of Charles II.



Bernicla canadensis (Linnæus*).

THE CANADA GOOSE.

Anser Canadensis.

The Canada Goose is a species which has been well known in a state of domestication since the time of Willughby, who describes and figures a bird living in St. James's Park. Yet, in the opinion of the Author, so frequently are specimens of the Canada Goose shot which do not exhibit either in their actions or plumage any signs of having escaped from confinement, and so often are flocks seen in different parts of the country, apparently in a naturally wild state, some pairs of which in the season produce and rear their young in places selected by themselves for this purpose, without requiring or receiving either care or food from man, that the Canada Goose seemed to him to be entitled to a place in this work.* The bird from which Bewick drew his figure of this species was shot at St. Germain's, in Cornwall, where other examples have also been obtained; several have been shot at different times in Hampshire; and the Rev. Leonard Jenyns states that large flocks have been observed in the fens of Cambridgeshire in a state of liberty and independence. Mr. Hancock states that one in his collection, killed on Prestwick Car in June 1836, was an adult, with plumage in excellent condition; nevertheless—he adds significantly —on examination a piece of string was found tightly encircling the leg above the true heel; proving that the bird had been in captivity.

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* *Anas canadensis*, Linnæus, Syst. Nat. Ed. 12, i. p. 198 (1766).

A writer in the Magazine of Natural History, vol. viii. p. 255, says, "In this neighbourhood (near Derby) we are frequently visited by small flocks of the Canada Goose, which always announce their approach by a loud noise, and, after wheeling two or three times round the piece of water near the house, they alight, and commence grazing. It frequently happens that two remain when all the rest are flown, and after reconnoitring the place for a few days, they usually fix on the corner of an island as their nesting-place. Shortly after the goslings have extricated themselves from their brittle covering, they are conducted to the water by the female, when they are joined by the male, who brings up the rear. The little family remain together till the return of the flock, when all mix promiscuously, recruit themselves for a few days, and then depart. A pinioned female was joined by a male. When they were approached, the male did not fly away until he was pursued so closely as to be in danger of being caught; he remained with his mate as long as was consistent with his liberty; when that was in danger, and not till then, he deserted the female. Several of the wild goslings were obtained in the season of 1832; two of them passed into the hands of a neighbouring farmer, in whose possession they have remained ever since. They associate with his domesticated Grey Lag Geese, and are very peaceable.'' The late Charles Waterton has given an interesting account of a similar nature, respecting a flock of pure and half-bred birds, which annually visited Walton Hall, followed by an amusing description of the union of a female of this species with a male Bernacle. Montagu had observed that the Canada Goose will breed with the common species, and it has also bred with the Knobbed Goose.

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* The Editor does not share this opinion.

Sir W. Jardine observes, in a note to his edition of Wilson's American Ornithology, "On the beautiful piece of water at Gosford House, the seat of the Earl of Wemyss, Haddingtonshire, the Canadian Goose and many other water birds rear their young freely. I have never seen any artificial piece of water so beautifully adapted for the domestication and introduction of every kind of water-fowl which will bear the climate of Great Britain. Of very large extent, it is embossed in beautiful shrubbery, perfectly recluse, and, even in the nearly constant observance of a resident family, several exotic species seem to look on it as their own. The Canadian and Egyptian Geese both had young when I visited it, and the lovely American Wood Duck, *Aix sponsa*, seemed as healthy as if in her native waters." Mr. J. H. Gurney, jun., states that in Norfolk at least a hundred Canada Geese live unpinioned on Gunton Lake, and there are a great many more in the parks at Holkham, Blickling, and Melton. Similar instances might be multiplied indefinitely; but, believing as the Editor does, that all the Canada Geese shot in Great Britain have resulted from artificial introduction, he considers it unnecessary to enumerate any more of the counties in which individuals of this species have paid the usual penalty for straggling. Single birds and flocks have occurred in Scotland, and in the Orkneys. In Ireland, where the Goose is also kept in semi-captivity, but in far smaller numbers than in England, its occurrences are disproportionally rare, notwithstanding the comparative proximity of that island to North America!

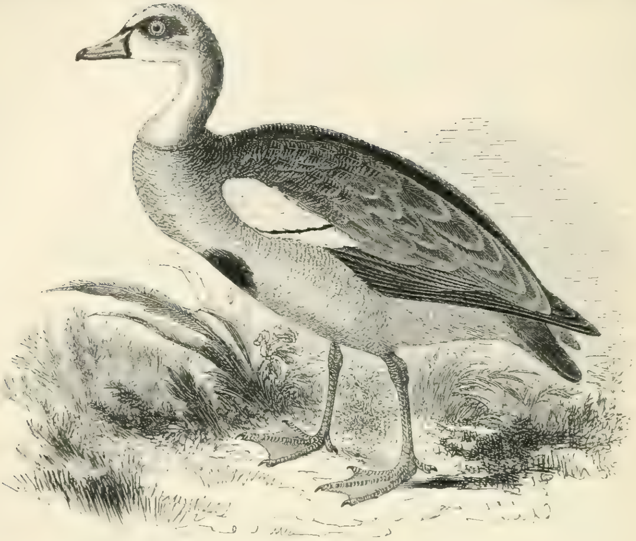
The Canada Goose appears to vary enormously in size, and, to a less degree, in coloration. According to the authors of the recently published 'North American Birds,' there are four distinguishable forms belonging to two sections. The first section comprises the large form *B. canadensis*, which inhabits the United States generally, and the British possessions, breeding chiefly north of 40°; and *B. occidentalis*, found on the north-west coast from Sitka in summer to California in winter. The second section consists of the much smaller *B. hutchinsi*, which breeds in the Arctic regions, migrating through the Western United States and Mississippi valley; and *B. leucopareia*, which breeds on the coast of Alaska, and migrates southwards into the Western United States. The form which has been introduced into the British Islands appears to be the first and largest of the four, which breeds in the eastern portions of Arctic and temperate North America in great numbers, migrating as far south as Mexico in autumn and winter; at which seasons it also visits the Bermudas. Before the settlement of the country it used to breed in Kentucky, and as late as 1819 Audubon found the nest, eggs, and young near Henderson, on the Ohio.

Richardson says:—"The Canada Geese, or 'bustards' of the Canadians (*les outardes*), breed throughout the wooded districts, but do not reach the vicinity of the Arctic Sea, except on the banks of some of the large rivers. The most northern localities in which we observed them were the channels between the alluvial islands which form the delta of the Mackenzie. They generally build their nest on the ground, but some pairs occasionally breed on the banks of the Saskatchewan in trees, depositing their eggs in the deserted nests of Ravens or Fishing Eagles." Mr. Macfarlane found five eggs of this species in a deserted Hawk's nest, warmly lined with down, which had apparently been plucked by the female from her own body; and Captain Bendire states that during a spring when the Harney valley, Oregon, was flooded, all the nests of the Canada Geese were placed in trees, principally willows; although during the previous dry season they were on the ground. The nests are composed of decayed leaves, dry grass, willow sticks, turf, and moss lined with feathers and down; the eggs, varying from six to nine in number, are thick-shelled, dull white in colour, and measure about 3·5 by 2·5 in.

The food of the Canada Goose appears to consist mainly of grass, but young birds are also partial to locusts, slugs, and snails. On the spring migrations, flocks not unfrequently alight in fields of young grain, and commit great havoc in the course of a single night. Both keenness of sight and quickness of hearing are remarkable in this bird, and it is so vigilant and suspicious that it is seldom taken by surprise. Its call is imitated by a prolonged nasal pronunciation of the syllable *wook* frequently repeated, and by this means it is sometimes decoyed within gunshot by the hunters in the Fur-countries.

The beak is black; the irides very dark brown; head, and nearly all the neck, black; chin and throat white, extending upwards, and ending in a point behind the ear-coverts. This white patch, from its similarity in colour and position to a neckcloth, has given origin to one of the names of the species, the Cravat Goose. The back and the wing-coverts, the secondaries and tertials, brown, the feathers of all these, except the first, with lighter-coloured edges; primaries and tail-feathers black; the rump also black; the upper tail-coverts white; lower part of the neck almost white; breast and belly pale brown; vent and under tail-coverts white; legs, toes, and interdigital membranes dark lead-colour, almost black. The whole length, according to Richardson, is forty-one or forty-two inches; the wing, from the carpal joint to the end of the second and longest quill-feather, nineteen inches and a half.

ANSERES. *ANATIDÆ.*



CHENALOPEX ÆGYPTIACA (Linnæus*).

THE EGYPTIAN GOOSE.

Anser Egyptiacus.

CHENALOPEX, *Stephens*†.—Bill as long as the head, slender, straight, the tip rounded, the margin laminated; the upper mandible curved, its tip hooked; the lower flat. Nostrils basal. Wings rather long, broad, armed with a bare knob. Tarsus stout, reticulated; anterior toes rather long, connected by a web; hind toe free, elevated. Tail consisting of fourteen rounded feathers.

EXCEPTIONS have been made—and, in the opinion of the Editor, most justly—to the admission of the Egyptian Goose into the Catalogue of our British Birds, on the ground that the specimens, though killed at large, or apparently in a wild state, had probably escaped from the waters of parks or pleasure grounds, where they had been bred and fostered on account of the beauty of their plumage. In deciding to admit this species as a genuine visitor to our islands, the Author appears to have been influenced by a questionable statement by Colonel Hawker, and by the erroneous assertions of Temminck. The former has been cited as mentioning "two killed in Norfolk, and three at Long-parish in Hampshire, in the winter of 1823; and the next year again, during some tremendous gales from the west, a flock of about *eighty* appeared near the same place, when two more were killed." Hawker, however, really gives the numeral *eighty* with a (!), on the gossip of some of his wild-fowlers, adding that he has no doubt the birds were importations, and considering that *eight* is the usual number of an unpinioned brood which generally takes wing simultaneously, it is more than probable that there may have been some misunderstanding. On the Continent there is not one single occurrence in Western Europe which is free from more than suspicion of very recent escape; Temminck's statement that this species has been killed on the Danube, in Turkey, and in Sicily, is absolutely unconfirmed; and the assertions of Von der Mühle and Lindermayer that it visits Greece, have not induced Mr. Dresser to include it in his 'Birds of Europe.'

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* *Anas ægyptiaca*, Linnæus, Syst. Nat. Ed. 12, i. p. 197 (1766).

† Shaw's Gen. Zool. xii. pt. ii. p. 41 (1824).

Besides various instances of single specimens of the Egyptian Goose having been obtained in this country, a flock of five were seen on the Fern Islands in April 1830. A small flock visited the Tweed in February 1832. Three were shot at Campsie, near Glasgow, in November 1832. Mr. Wallace, of Douglas, sent the Author word that a flock of nine were seen in the Isle of Man, in September 1838. Four were shot on the Severn, near Bridgewater, in February 1840; two were shot in Dorsetshire in 1836; and Colonel Hawker's record has already been mentioned. Other examples have been killed in Kent, Sussex, Dorsetshire, Hampshire, Somersetshire (where numbers have been kept, and allowed to fly at Sandhill, Cothelston, and Lydeard, near Taunton), Devonshire, Cornwall, Norfolk, Cambridgeshire, Northamptonshire, Nottinghamshire, &c.; also in Ireland, on the Boyne.

In a wild state, this species is found along the Nile valley to the south of Cairo, and throughout the greater part of tropical Africa. There it is said to be partial to holes, and Mr. J. H. Gurney, jun., observed it frequenting the ledges of lofty and inaccessible cliffs for nesting purposes; but birds hatch and rear their young very freely in confinement. The eggs are of a dull buffish-white, measuring 2·8 by 2 in. The note is like the barking of a dog. In its manner of feeding this bird is decidedly Anserine.

In the summer of 1838, an Egyptian Goose, in the garden of the Zoological Society, paired with a Penguin Drake,* the eggs being productive; and again in the following season, when the young birds were preserved, and kept by themselves experimentally. Next year many eggs were produced between these hybrids, but the eggs were not productive, and exhibited no embryos. An Egyptian Goose has bred with the Knobbed or Swan Gander (*A. cygnoides*), and with the Spur-winged Gander (*P. gambensis*), at the Dublin Zoological Society in the Phœnix Park.

The upper mandible of the beak is horn-colour, tipped with pink; the under one cherry-red; nail, margins, and base dark brown; irides wax-yellow; round the eye a patch of chestnut-brown; cheeks and sides of the neck pale rufous-white; forehead, crown of the head, back of the neck, the back, and scapulars, rich reddish-brown; carpal portion of the wing, and wing-coverts, white; the smaller coverts tipped with black; wing-primaries almost black, tinged with green; the secondaries tinged with reddish-bay, and edged with chestnut; lower part of the back, rump, and tail, nearly black; front of the neck, breast, and upper part of the belly, pale rufous-brown, a patch on the breast chestnut-brown; lower part of the belly and the vent pale brown; legs and feet pink.

The whole length of an adult male is about twenty-six inches. The distribution of colours is the same in females as in males, but the tints are less bright and pure. The wing is furnished with a short blunt spur at the wrist.

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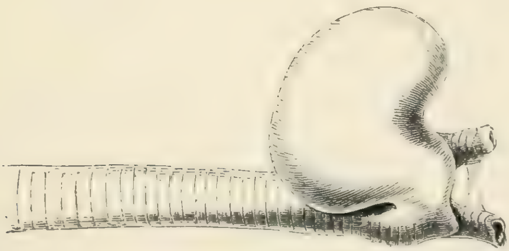
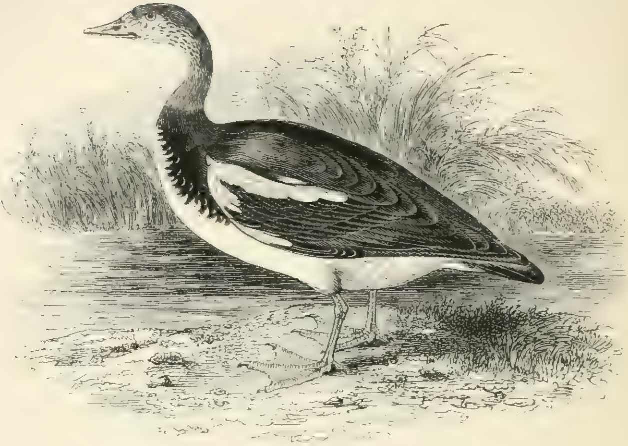
* The Penguin Duck, so called from its walking nearly upright, is only a variety of the Common Domestic Duck.

In a young bird hatched at Mr. Cecil Smith's, in March 1882, which flew away and was shot in August, the head was more mottled, and the under parts and mantle more marked with grey and brown vermiculations than in the adult; the secondary wing-coverts white with grey and black margins, forming an ill-defined bar; tail nearly black, mottled with brown; line at the base of the bill pink, and not black, as in the adult; feet dull pink.

A nestling had the bill horn-black; upper parts dark brownish-grey; under parts dirty-white; feet clay-coloured.

The tube of the windpipe is about twelve inches long, nearly cylindrical in form throughout; but, unlike those of the other Geese, the male has a hollow bony enlargement, half as thick as it is wide, at the bottom of the tube on the left side, as shown in the vignette below, where the lower portion of the windpipe, the bony enlargement, and the short depending bronchial tubes, the last slightly connected by a thin slip of membrane, are figured of the natural size. The view is taken with the tube and its enlargement in the natural position, the breast-bone being removed, as in the case of the view of the windpipe of the Spoonbill figured in the present volume.





Plectropterus gambensis (Linnæus[*]).

THE SPUR-WINGED GOOSE,

OR GAMBO GOOSE.

Anser gambensis.

Plectropterus, *Stephens*[†].—Bill nearly as long as the head, sub-cylindric, obtuse, furnished with a fleshy tubercle at the base, the margins laminated. Nostrils sub-basal. Wings rather long, armed with strong projecting spurs at the bend. Tail rather short, rounded. Legs moderately long; three anterior toes rather long, united by a web; hind toe free.

This native of tropical Africa is known to have been kept in confinement for upwards of two centuries, and Willughby, who figures it in his 'Ornithology,' published in 1678, says that he took his description of this and the Canada Goose from examples among the King's water-fowl in St. James's Park. It has not been known to occur as a straggler in any of the southern countries of Europe which are so much nearer to its native haunts, nor does it even appear to inhabit those portions of Africa which lie to the north of the tropic of Cancer. The Editor has no doubt that the occurrences recorded have been those of birds escaped from confinement; but, inasmuch as the Author thought fit to include the species, it is retained in the present Edition of a work which still bears his name.

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[*] *Anas gambensis*, Linnæus, Syst. Nat. Ed. 12, i. p. 195 (1766).

[†] Shaw's Gen. Zoology, xii. pt. i. p. 6 (1824).

A specimen of this African Goose, killed in Cornwall in June 1821, was presented to Bewick by Mr. Mewburn; and the figure in the 1826 Edition of Bewick's 'British Birds' was taken from this example, which is in the Museum at Newcastle. Mr. G. T. Fox ('Synopsis,' p. 252) gives the following particulars, supplied by Mr. Mewburn:—"'When first seen, it was in a field about four miles from St. Germain's, near which it remained for two or three days. Being several times disturbed by attempts to shoot it, it came down upon the shore of the St. Germain's River, when the following day, the 20th of June, 1821, it was shot by John Brickford in a wheat-field about a mile from St. Germain's. Some gentlemen who saw it the following day, requested him to let me have it; but he had a wife who thought she could stuff it; but being soon convinced of her inability, she cut off the wings for dusters, and threw the skin away; and it was not till three weeks afterwards that I heard of the circumstance, when I sent a servant, who brought it covered with mud, the head torn off, but luckily preserved, as also one wing, when I put it together as well as I was able.' The skin, in this state, was forwarded to Newcastle by Mr. Mewburn, for Bewick's use, whence it passed into Mr. R. Wingate's hands, who has most ably reset it."

In 'The Naturalist' for 1855 (p. 181), Mr. Thomas Edward describes a bird shot about the middle of February of that year, near Banff; in the winter of 1858–59 one was shot on the Thames, as described by Mr. Clark Kennedy ('Birds of Berks and Bucks,' p. 201); and, according to Dr. H. Moses ('Science Gossip,' 1870, p. 51), one was shot at Upavon in Wiltshire on the 4th September, 1869. Mr. Sclater states that this Goose was one of the earliest inhabitants of the Zoological Society's Gardens, and eggs were laid, but not hatched, in 1868. They were white, smooth and shining; a specimen from the Transvaal, in the collection of Mr. Bidwell, measures 2·8 by 2 in.

The Spur-winged Goose is a native of intertropical Africa, from Senegambia to the Transvaal and the Zambesi; but in Abyssinia and the neighbouring districts of eastern Africa, its representative is a distinct species, *Pl. ruepelli.* For details of habits and distribution reference may be made to Layard and Sharpe's 'Birds of South Africa,' and to Bocage's 'Ornithologie d'Angola.' Although called a 'Goose,' this bird is more nearly allied to the Ducks; and its manner of feeding resembles that of the latter.

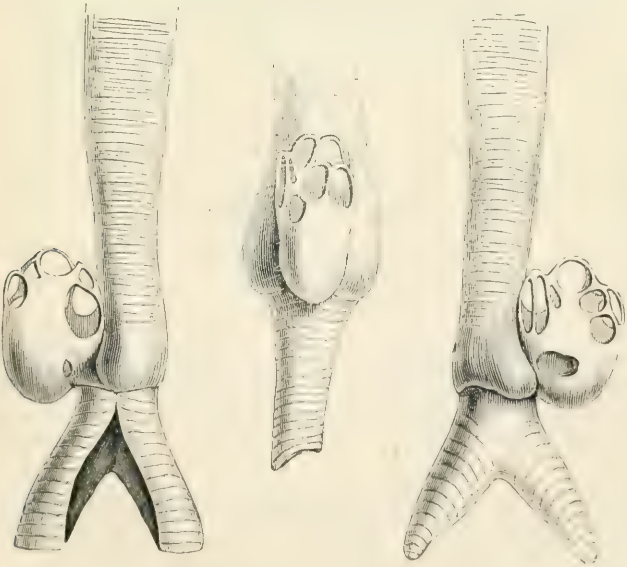
Bewick's description of the specimen at Newcastle is as follows:—"The bill is reddish-yellow, with a jointed protuberance on the base of the upper mandible. The upper part of the head and neck are dingy-brown; the auriculars and sides of the throat are white, spotted with brown; the lower part of the neck, sides of the breast, and all the upper plumage appear black, but this colour is lost, particularly in the scapulars and tertials, which are most resplendently bronzed and glossed with brilliant green, and most of the outer webs of the other feathers partake of the same hue; on the bend of the wing or wrist, is placed a strong white horny spur, about five-eighths of an inch in length, turning upwards, and rather inwards; the whole of the edges of the wing from the *alula spuria* to the elbow and shoulder are white, all the under parts the same. This beautiful bird is nearly of the bulk of the Wild Goose, but its legs and toes are somewhat longer, and of a red or orange yellow."

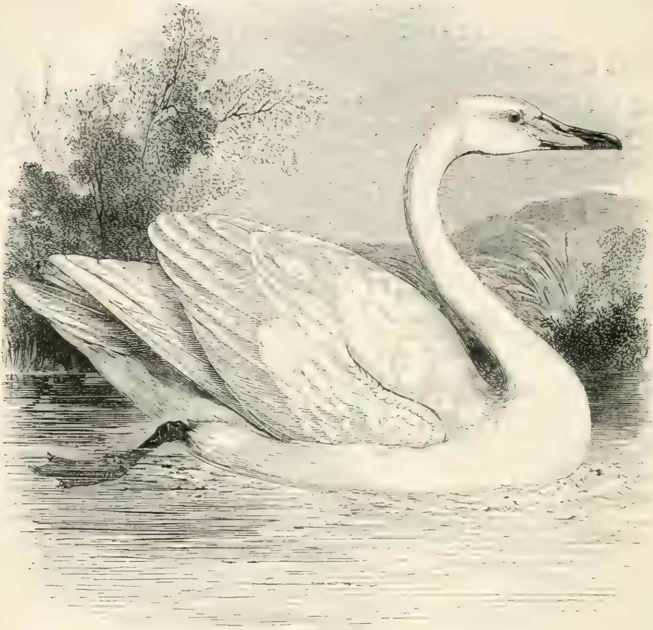
To give the actual appearance of the British-killed specimen, the Author had the figure taken from Bewick's work.

On the death of a male which had lived nearly twelve years in the Gardens of the Zoological Society, advantage was taken of this opportunity to examine the organ of voice, generally found to possess some remarkable variety in form and structure throughout most of the species of this family;

and the expectation having been realized, the Author was permitted to publish the following description and figures:—

The windpipe of the Spur-winged Goose is about sixteen inches long, the tube flattened throughout the greater part of its length, but cylindrical at the bottom. The vignette represents the lower portion of the windpipe from three points of view. The figure to the right shows the tube with its bony enlargement on the left side, being its position in the body of the bird; the other figures to exhibit the circular and oval apertures pervading different parts of this bony enlargement; the opposite sides not being exactly alike, either in the number, form, or situation of these apertures in the bone, which in a natural state are closed by delicate transparent membrane. The bronchial tubes are divided higher at the back than in front, as shown in the left figure, to allow free passage for the œsophagus between them from behind forwards.





CYGNUS MUSICUS, Bechstein.*

THE WHOOPER,

ELK, OR WHISTLING SWAN.

Cygnus ferus.

CYGNUS, *Bechstein*†.—Beak of equal breadth throughout its length; higher than wide at the base; depressed at the point; both mandibles furnished along the sides with transverse serrated lamellæ. Nostrils oblong, lateral, near the middle of the beak. Neck slender, and very long. Legs short, the hind toe small and free.

THE WHOOPER, so called on account of the peculiar note uttered by this bird, is a winter visitor to the British Islands, arriving in flocks, which are generally more numerous as the weather becomes more severe. Low, in his 'Fauna Orcadensis,' writing about 1774, says, "The Wild Swan is found at all seasons in Orkney; a few pairs build in the holms of the loch of Stenness. These, however, are nothing to the flocks that visit us in October from the more northern climates, their summer retreats. Part of these continue with us all the winter, and the rest go to Caithness and the other northern shires of Scotland; in April they go off again to the northward, except the few which remain here for the summer. Like the wild geese, these birds fly in the fashion of a wedge, making a fine melodious clang, which has, perhaps, furnished one occasion to give a musical voice to this bird." The Wild Swan has long since ceased to breed in the Orkneys; but in numbers depending upon the rigour of the season, it annually visits the coasts and islands of Scotland upon its autumn migrations; and, on the return, in spring, individuals out of the passing flocks have been observed to linger about the localities which their (presumed) ancestors found suitable for nesting purposes. In December various flocks are seen flying in compact bodies, directing their course southward, particularly along the coast lines, and specimens are to be seen in the London markets. Many reach the sea on our southern coast. The late Earl of Malmesbury sent the Author, in the spring of the year 1838, a list of four hundred and sixteen wild-fowl, killed at Heron Court during the frost, from January the 9th to February the 24th; and this list included thirty-three Whoopers. Colonel Hawker, describing the successful shots he had made at Swans, when wild-fowl shooting between Lymington and Poole harbour, says:—"The Whoopers, before they have been shot at, are easier of access than many other wild birds; and if, when flying, they are fired at directly under the hollow of the wing, or, when swimming, through the head, they may be stopped at a reasonable distance, with a common double gun and small shot; perhaps even farther than other wild-fowl, as, when struck in the body, they become helpless from their weight, and their heads are less likely to escape between the shot than those of smaller fowl. On one occasion I knocked down eight at a shot, seven old ones and a brown one, and they averaged nineteen pounds each. The old gander was only winged; and when he found himself overtaken by my man, Read, he turned round and made a regular charge at him."

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* Gemein. Naturg. Deutschl. iii. p. 830 (1809).

† Orn. Taschenb. ii. p. 404 (1803).

In the severe winter of 1870-71, Whoopers were unusually abundant on our coasts. Mr. J. H. Gurney, jun., was informed by a dealer in Leadenhall Market that he had received as many as a hundred during the frost, mostly from the neighbourhood of King's Lynn; and a poulterer at Lynn said that he had had thirty. The largest flocks hitherto reported in the migration schedules are from near Spurn, where on the 18th of December, 1879, thirty were seen, all young in the brown plumage, except one old bird which was acting as pilot; and at the Dudgeon light-vessel, on the 24th of November, 1882, fifty, all white, passed to the westward.

On the coast of Ireland, according to Sir R. Payne-Gallwey, the Whooper is far less common than its smaller congener, Bewick's Swan, and he has seldom met with a dozen of the former together, whereas the latter are sometimes in hundreds.

The Whooper visits the Færoes, and is generally distributed during the breeding-seasons in Iceland. According to Reinhardt, it formerly bred near Godthaab in Greenland; and as he speaks of having examined specimens from thence, it is to be presumed that they were correctly identified as belonging to this species, and not to the American *C. buccinator* or *C. americanus.* It nests in Norway, principally beyond the Arctic circle, and more abundantly in Swedish Lapland, Finland, and Northern Russia; and across Siberia, in which its breeding range appears to extend as far south as the elevated lakes of Mongolia. In winter it visits China, and is, according to Capt. Blakiston, the commonest species of Swan in Japan; it is said to have occurred in Nepal; passes through Turkestan on migration; is abundant during the severe weather on the southern shores of the

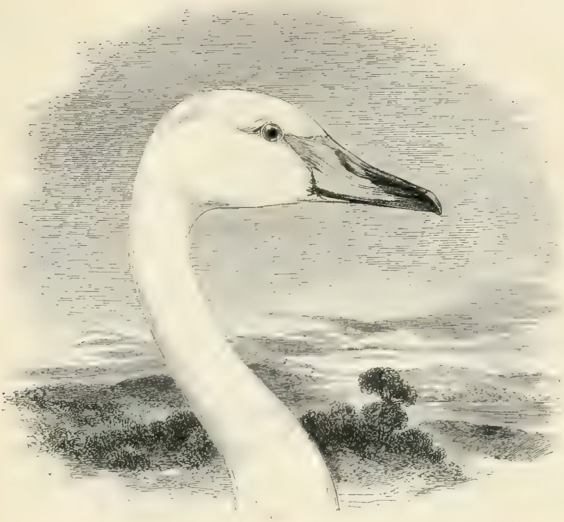
Caspian; has been identified by Canon Tristram at Jerusalem; and visits Lower Egypt, and the lakes of Algeria in winter. On the Continent, south of its breeding range already traced, it occurs on migration down to the Mediterranean and its islands; being at times very abundant in the Black Sea and its vicinity.

The late Mr. Dann, in a note to the Author, says, "The Wild Swan appears in Lapland with the first breaking up of the ice, and is the earliest of all the Anatidæ in its return north. They frequent the most secluded and uninhabited swamps and lakes in the wooded districts, and are found only in scattered pairs south of Juckasierva; thence in a north-eastern direction they are reported to be very numerous, but I did not fall in with any during my stay in Lapland." They make a large nest of rushes and coarse herbage; the egg is of a uniform pale yellowish-white, and measures about 4·5 by 2·9 in. Incubation commences in the latter half of May, lasting forty-two days; and Dr. Palmén states that the young grow so slowly as to be unable to fly until the end of August, or even later. The food of this species consists of grasses, woods, and seeds of plants.

Linnæus saw Wild Swans several times during his tour in Lapland, and mentions that at the residence of the governor of the province at Calix, he saw three, which, having been taken when young, were as tame as domestic Geese. Bechstein says that in Russia the Whooper is more frequently domesticated than the Mute Swan. A pinioned female, in the possession of Montagu, laid an egg. Some years ago the Author had an opportunity of seeing ten or twelve Whoopers in a stable in London. These fine birds had been procured by Mr. Castang, the well-known dealer in birds, for the late Earl of Egremont, and the Swans were shortly afterwards sent to Petworth, where, it was said, they produced young. At the time the Author saw these birds, he also heard the voice of one of them, a very old and large male; the note resembled the sound of the word "whoop," repeated loudly ten or twelve times in succession. At the Gardens of the Zoological Society a pair of Whoopers bred on one of the islands in the summer of 1839, and a curious occurrence took place in reference to the brood. The cygnets, when only a few days old, were sunning themselves on the margin of one of the islands, close to the deep water. The parent birds were swimming near. A Carrion Crow made a descent and struck at one of the cygnets; the old male Whooper came to the rescue in an instant, seized the Crow with his beak, pulled him into the water, and in spite of all his buffetings and resistance, held him there till he was dead.

Cuvier gives full particulars of the hybrid offspring resulting from the union of a male Whooper with a female domestic Goose described as ' une jeune oie monstrueuse née au printemps avec trois pates ' [*sic*] (Ann. Mus. Hist. Nat. xii. p. 119).

The Whooper may be immediately distinguished from other species among the Swans, by the characters to be observed about the head. Willughby, besides giving a figure of the whole bird, introduced in addition the head only, of larger size, to show the specific peculiarity. Edwards gave the head of our Mute Swan on the same plate with his figure of the Whooper, to show the distinction. This plan of engraving the heads only, has been adopted with excellent effect by Col. Hawker, in his very popular work, and the Author has followed his example of giving the head only, of large size, rather than give repetitions of similar white bodies. The first here introduced is the head of the adult Whooper. The anterior part of the beak is depressed and black; the posterior or basal part quadrangular and yellow; this latter colour extending considerably forward along each lateral margin of the upper mandible, beyond the openings of the nostrils, which are black; the lore, or bare space between the base of the upper mandible and the eye, is also yellow: the irides dark; the head, neck, and the whole of the plumage of the body and wings in adult birds, pure white; some specimens, occasionally only, exhibiting a rufous or ochreous tint at the tips of the feathers on the head; the legs, toes, and their membranes black.

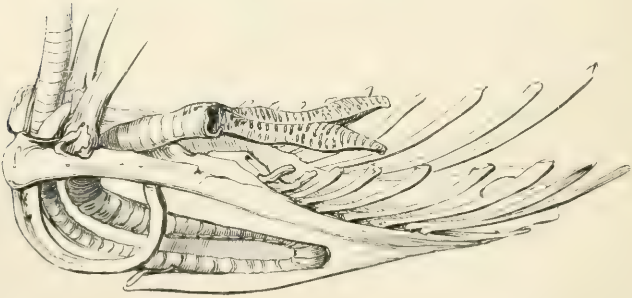


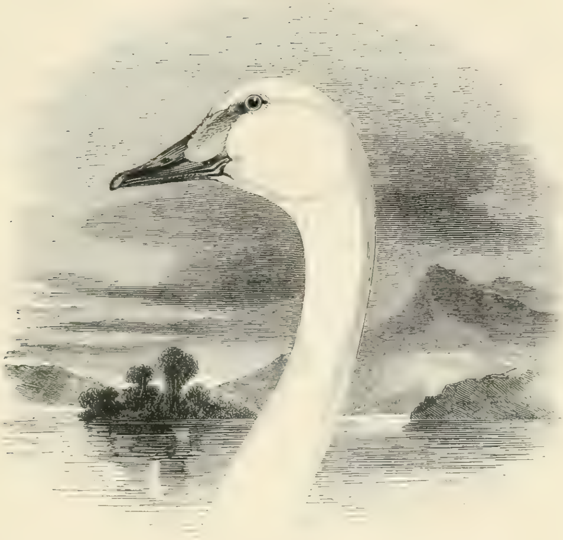
The whole length from the point of the beak to the end of the tail is five feet. From the carpal joint of the wing to the end of the longest primary quill-feather, twenty-five inches and a half; weight twenty-four pounds.

The young birds produced at the Gardens of the Zoological Society, when about ten weeks old, in the middle of August, had the beak of a dull flesh-colour, the tip and lateral margins black; the head, neck, and all the upper surface of the body pale ash-brown; the under surface before the legs of a paler brown; the portion behind the legs dull white; the legs, like the beak, of a dingy flesh-colour. By the middle of October they had the beak black at the end; a reddish-orange band across the nostrils, the base and lore pale greenish-white; the general colour pale greyish-brown; a few of the smaller wing-coverts white, mixed with others of a pale buffy-brown; the legs black. These young Whoopers, bred in 1839, had lost almost all their brown feathers at the autumn moult of 1840, and before their second winter was over they were entirely white; the base of the beak lemon-yellow.

The internal distinctions of the Whooper are more conspicuous than those which have been referred to as external, and of the former, the organ of voice furnishes the most valuable and decisive characters. This peculiarity was known to Willughby, but it was previously noticed by Sir Thomas Browne, who mentions "that strange recurvation of the windpipe through the sternum."

The cylindrical tube of the trachea or windpipe passes down the whole length of the long neck of the bird, in the usual manner, but descends between the two branches of the forked bone, called the merrythought, to a level with the keel of the breast-bone or sternum. The keel of the breast-bone is double, and receives between its two plates or sides, the tube of the trachea, which, after traversing nearly the whole length of the keel, turns suddenly upon itself, passing forwards, upwards, and again backwards, till it ends in the vertical bone of divarication, whence the two long bronchial tubes go off, one to each lobe of the lungs. This singular structure will be understood by a reference to the vignette below, where a portion of one side of the keel is removed to show the convoluted tube within. The depth of the insertion is not so considerable in females or young males.





CYGNUS BEWICKI, Yarrell.*

BEWICK'S SWAN.

Cygnus Bewickii.

IN the winter of 1823-24, the Author prepared and preserved the trachea and part of the bones of a young Wild Swan, shot in this country, which possessed peculiarities he had never observed in the Whooper at any age, inducing the belief that they belonged to a distinct species. At the sale of part of the valuable collection of the late Joshua Brookes, in July 1828, the Author purchased the sternum and trachea of a Swan presented to and prepared by Leach, which belonged to an adult bird of the same species as the bones of the young one just mentioned. These materials the Author exhibited at the Zoological Club of the Linnean Society, on the 24th of November, 1829, contrasting them with analogous parts of the Whooper, pointing out the anatomical distinctions between them; and proposing to consider the bird as a distinct species. Early in the following December the Author was presented by Mr. J. B. Baker with the sternum and trachea of a third example of this new species, shot at Yarmouth during the winter of 1827-28. During the severe weather of the same month, Wild Swans were unusually numerous; more than fifty were counted in one flock at Whittlesea Mere. From a considerable number which had been forwarded to the London markets for sale, the Author selected five examples of this new species, of different ages; and, possessing thus a series of gradations in structure, he described them in a paper read before the Linnean Society, and proposed to call the species 'Bewick's Swan'; thus devoting it to the memory of one whose beautiful delineations of subjects in natural history entitled him to this tribute. These Swans being plentiful, from the severity of the winter, others were procured in different parts of the country. The late Mr. Richard Wingate, of Newcastle, who had also obtained specimens and observed the difference between them and the Whooper, read a notice upon the subject at the Natural History Society at Newcastle, and as he was one of the oldest as well as one of the warmest friends of Thomas Bewick, he adopted the name the Author had proposed.

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* Tr. Linn. Soc. xvi. p. 453 (in a paper read 19th January, 1830).

This species is one-third smaller than the Whooper at the same age; and the yellow patch at the base of the bill is noticeably different in its size and distribution. When the external characters were made known, several museums and collections in different parts of the country were found to contain specimens; and, in fact, subsequent experience has shown that Bewick's Swan is a tolerably frequent visitor in severe winters on the coasts of England and Scotland, although decidedly rarer than the Whooper. In Ireland, however, as expected by Thompson and shown by Sir R. Payne-Gallwey and others, it is by far the more abundant species. Mr. R. Warren writes that on the 17th of December, 1880, a herd, numbering two hundred or two hundred and fifty, was seen on Lough Cullen, co. Mayo, by Capt. Kirkwood, of Bartragh. Mr. Pike of Achill says that this Swan arrives every winter on the lakes the first week of December in considerable numbers, as many as eight hundred at one time having been observed during the unexampled frost of 1881, on the lake of Castle Gregory, belonging to Lord Ventry, in co. Kerry. Hundreds, and even thousands, are said to have been counted in other localities; but the above instances will suffice to give an idea of the abundance of this species on the west coast of Ireland during severe weather in the north. Sir R. Payne-Gallwey adds that there is a very general feeling in Ireland, especially in the west, against slaying a Swan; and the majority of fowlers cannot be induced for any pecuniary reward to fire at one, holding as they do, the quaint idea that a departed spirit, perhaps one of their own kin, is imprisoned in the outward form of each bird. The note of this species sounds like the word "tong" quickly uttered, and is very different from the "whoop, whoop-whoop, whoop," of its larger congener.

Bewick's Swan is not known to occur in Iceland, and certainly not in Greenland. It visits Norway, no less than nine examples being recorded by Dr. Stejneger in his important monographical paper on the Swans (Pr. U.S. National Mus. 1882, p. 209); it has occurred several times in Finland; and its migrations extend along the coasts of Europe, even to the Mediterranean, a single bird having been shot out of a small flock near Lucca, in Italy, during the winter of 1874. It passes through southern Russia; and in the north, according to Henke, it breeds near Archangel; as it certainly does on the Petchora, where Messrs. Seebohm and Harvie-Brown obtained the first identified eggs on record. Its occurrence on Novaya Zemlya has been established, and it is said to nest there; but be this as it may, this species seems to be the most numerous of the Swans on the arctic portions of the mainland of Siberia, and the low islands to the north. Mr. Seebohm saw thousands flying northwards in spring on his visit to the Yenesei; and he obtained eggs in 69° 30′ N. lat., where, in fact, he observed no other species of Swan. It is found on the Lena, and its breeding-range probably extends over the 'tundras' of Siberia north of the forest-growth; Prof. Radde received it from the elevated steppes of Dauria; Père David says that in China it is more abundant in winter than the Whooper; and it appears to be found at that season in Japan.

No details are yet known respecting the nidification of Bewick's Swan, for Messrs. Seebohm and Harvie-Brown were baffled in their attempts to identify by watching—or trapping the birds on the nests which they personally inspected. They succeeded, however, in obtaining two eggs taken by a fisherman who had caught the parent bird on the nest; the skin proved to be that of Bewick's Swan, and the history bore the strictest investigation. The eggs, which are white and dull, measure 3·9 by 2·6 in.; smaller, as might be expected, than those of the Whooper. Other eggs, which were identified by their size and general appearance, but respecting which there can be no reasonable doubt, were obtained by Mr. Seebohm on his subsequent visit to the Yenesei.

Thompson mentions that in February, 1830, a flock containing seven of these Swans alighted in a flooded meadow near Belfast, when two of them were so disabled by a shot as to be, after some difficulty, secured. They were bought by his friend Mr. William Sinclaire, and their wounds being found so trivial as merely to incapacitate them from flight, they were placed in his aquatic menagerie. Mr. Sinclaire states that every spring and autumn since he has had these Swans, they have regularly, about the months of March and September, become very restless, and for the period of at least three weeks have wandered from the enclosure within which they are contented to remain all the rest of the year. In disposition they are timid and extremely gentle, and never attempt to molest any of the wild-fowl confined in the same pond with them, though all of these are their inferiors in strength and size. Their call, chiefly uttered at the migratory period, is a low deep-toned whistle, once repeated.

Thompson states, that a wounded Bewick's Swan, presented to the Zoological Society of Dublin in 1841, was still living there in 1849, and had coupled on two successive seasons with a Black Swan, but there was no produce. Mr. Sclater says (P. Z. S. 1880, p. 507), that so far as he is aware Bewick's Swan has never bred in captivity. Two live birds were in the Knowsley sale in 1851.*

Young birds as they appear here in the plumage of their first winter are greyish-brown. At their second winter, when they have acquired the white plumage, the irides are orange; the head and breast strongly marked with rusty-red †; base of the beak lemon-yellow; when older, some continue to exhibit a tinge of rust-colour on the head, after that on the breast has passed off. The adult bird is of a pure unsullied white, the base of the beak orange-yellow; the irides dark; the legs, toes, and membranes, black; the figure at the commencement of this subject shows the distribution of black and yellow on the beak, which is liable to a little variation.

The whole length is from three feet ten inches to four feet two inches. From the carpal joint to the end of the longest primary, twenty-one inches; the second and third quill-feathers longer than the first and fourth; tail-feathers normally twenty, but in young birds sometimes eighteen or nineteen.

In anatomical structure this species differs more decidedly from the Whooper than in its external characters. The most obvious difference is in the trachea, which forms one of the best distinctions in the separation of nearly-allied species throughout this numerous family. The tube of the windpipe is of equal diameter throughout, and descending in front of the neck enters the keel of the sternum, which is hollow, as in the Whooper, traversing its whole length. Having arrived at the end of the keel, the tube then, gradually inclining upwards and outwards, passes into a cavity in the sternum destined to receive it, caused by a separation of the parallel horizontal plates of bone, forming the posterior flattened portion of the breast-bone, and producing a convex protuberance on the inner surface. The tube also changing its direction from vertical to horizontal, and reaching within half an inch of the posterior edge, is reflected back after making a considerable curve, till it once more reaches the keel, again traversing which, in a line immediately over the first portion of the tube, it passes out under the arch of the merrythought; where, turning upwards, and afterwards backwards, it enters the body of the bird to be attached to the lungs in the usual manner. This is the state of development in the oldest bird the Author met with. The degree next in order, or younger, differs in having the horizontal loop of the trachea confined to one side only of the cavity in the sternum, both sides of

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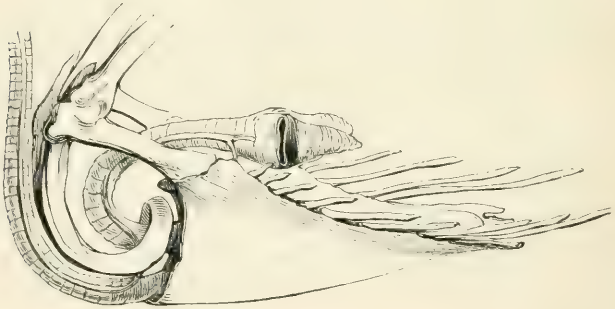
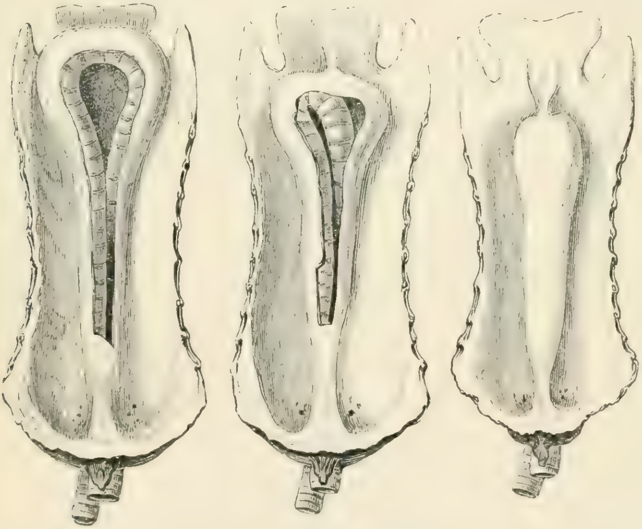
* It would be interesting to know what became of these two Bewick Swans, and whether they formed a *pair*, for the following reason:—In May 1853, the Editor examined a Bewick's Swan in Leadenhall Market, with two eggs said to belong to it, and he purchased the unblown eggs for half-a-crown a piece. The dealer refused another half-crown for the head of the Swan for the purposes of identification, insisting upon nothing less than ten shillings for the entire bird, an additional expenditure which the state of the Editor's finances in those youthful days did not justify. The eggs correspond in appearance and measurements with those obtained by Mr. Seebohm; and there can be little doubt that the Swan had been killed on her nest by some poacher in a park or estate, probably at no great distance from London.

† This rust-colour, which has been much insisted upon, is found on many birds, especially waterfowl, and is known to be due, in their case, to the presence of peroxide of iron in the water which they frequent.—[Ed.]



the cavity being at this time formed, although the loop of the tube is not yet sufficiently elongated to occupy the whole space. The third and right-hand one of the three representations below, from a still younger bird, possesses only the vertical insertion of the fold of the trachea; yet in this specimen the cavity in the posterior portion of the sternum already exists to a considerable extent.

The above are the peculiarities of structure belonging to the tube and the sternum. The bronchiæ are very short; but the flexible part intervening between the bone of divarication and the bronchial rings is considerable, producing an effect to be hereafter noticed; this elongated, flexible, and delicate portion being defended on each outer side by a distinct membrane, attached to the whole edge of the bone of divarication, and to a slender semicircular bone on each side, by which it is supported.

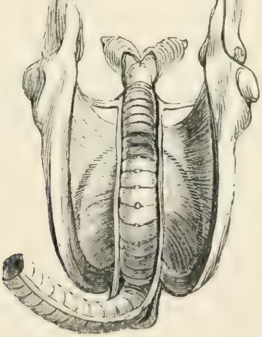


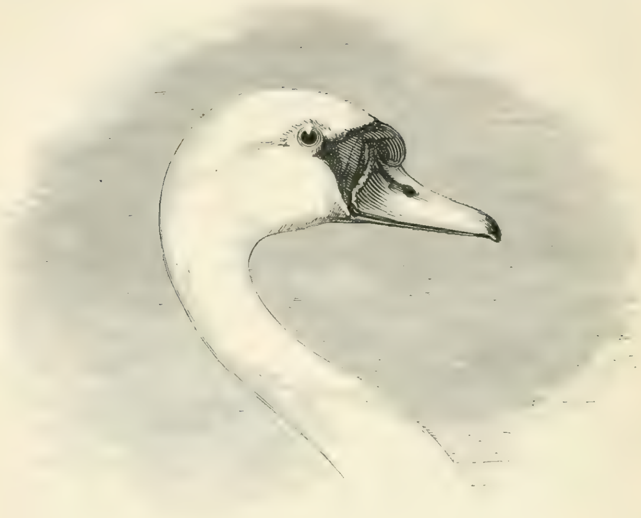
The muscles of voice with which this bird is provided pass down—as usual—one on each side of the trachea, till the tube is about to enter the cavity in the keel; they then quit that part of the tube to be attached to the ascending portion of the curve, which they follow, ultimately dividing into two slips, one of which—inserted upon the surface of the bone of divarication—governs the length of the preceding flexible portion of the tube ; the other slip passes off downwards to be attached to the inner surface of the breast-bone, anterior to the first rib. The course of the muscle on one side may be traced in the first anatomical figure.

Dissection, which conclusively proved the distinction between the Whooper and Bewick's Swan, has also shown that the two Wild Swans of North America differ internally as well as externally from the two Old World species already described. The largest of the North American Swans, superior in size to our Whooper, is called *Cygnus buccinator*, or the Hunter's Swan, by Richardson, in his 'Fauna Boreali-Americana,' where the measurements and other particulars of its history will be found. The Author was indebted to the liberality of Richardson for a preparation of the very singular organs of voice and the sternum of this species, which will be found described and figured in the Transactions of the Linnean Society, vol. xvii. An immature Swan, which in the opinion of some ornithologists belongs to this species, is in the Aldeburgh Museum ; being one of four killed in October 1866 (Hele's 'Notes about Aldeburgh,' p. 147). However, the sternum of another bird out of this flock, proved, on examination, to have no cavity for the windpipe, therein resembling the Mute Swan ; whereas the genuine *C. buccinator* has a cavity like that in the Whooper !

The second species of North American Swan was described by Dr. Sharpless (American Jour. Sc. xxii. p. 83), under the name of *Cygnus americanus* [*C. columbianus*, Ord] ; and subsequently by Audubon. The Author was presented by these gentlemen with the organ of voice and the sternum from several examples of this species, which in some respects, internally as well as externally, resembles our Bewick's Swan, although attaining a size and weight almost equal to those of our Whooper ; the whole length reaching four feet six inches, and the weight twenty-one pounds. Macgillivray was under the impression that he had recognized an example of this American Swan in an immature bird purchased at a poulterer's at Edinburgh in February, 1841, and he described it as such. Again, five Wild Swans were found in a poulterer's shop in Edinburgh on the 26th December, 1879; and it was stated that four of these on dissection also proved to be *C. americanus* (Zool. 1880, p. 111). There seems, however, good reason to doubt the correctness of the diagnosis, and some remarks on the subject, with illustrations of the bills of this and Bewick's Swan in the 'Proceedings of the Natural History Society of Glasgow,' vol. iv. p. 318, may be consulted with advantage by those who are in haste to add fresh species of waterfowl to the 'British' list.

The vignette represents a front view of a portion of the body of Bewick's Swan; the anterior part of the descending windpipe being turned aside to show its inner ascending part, the muscles of voice, and the tendinous fascia stretched across from one branch of the forked bone or merrythought, over to the other, by which both portions are supported. This, and other anatomical representations, necessarily very much reduced in size here, will be found on a larger scale in the sixteenth volume of the Linnean Transactions.





CYGNUS OLOR (Gmelin*).

THE MUTE SWAN.

Cygnus olor.

THE most obvious difference, and that which will immediately strike the observer on comparing the representation of our Mute, half-domesticated Swan, with those of the Whooper and Bewick's Swans, is, that the two most conspicuous colours on the beak occupy opposite situations in these species. In the Whooper and Bewick's Swans the anterior portion of the beak is black, the base and the lore to the eye, orange-yellow; but in the Mute Swan it is the anterior portion of the beak which is of a rich reddish-orange, the base and the lore to the eye black, and on the upper part of the forehead there is a prominent black tubercle or knob, which in old males attains considerable size.

* *Anas Olor*, Gmelin, Syst. Nat. i. p. 501 (1788).

The male Swan has frequently been styled "the peaceful monarch of the lake"; but this is his character during part of the year only; for during the season of incubation and rearing the young there is scarcely any bird more pugnacious, and from his great size and power he is in reality a monarch to be feared and avoided by all that inhabit his domain.

The nest, consisting of a large mass of reeds, rushes, and other coarse herbage, is formed on the ground near the edge of the water, and an island is generally chosen rather than the bank. The female produces six or seven eggs; * these are of a dull greenish-white, averaging 4 inches by 2·8 in. Incubation lasts six weeks, during which time the male is in constant attendance upon the female, occasionally taking her place upon the eggs, or guarding her with jealous care, giving chase and battle, if necessary, to every intruder.

The young, when hatched, which is generally about the end of May, are conducted to the water by the parent birds, and are even said to be carried there: it is certain that the cygnets are frequently carried on the back of the female when she is sailing about in the water. This the Author has witnessed on the Thames, and has seen the female, by raising her leg, assist the cygnets in getting upon her back. He thought it probable that carrying the young might only be resorted to when the brood inhabited a river, to save the young the labour of following the parent against the stream; but, during the summer of 1841, a female Swan was frequently seen carrying her young on the lake in St. James's Park, where there is no current to impede their course. A short quotation from the first volume of 'Gleanings in Natural History,' by Mr. Jesse, corroborates several points in the habits of this bird:—"Living on the banks of the Thames, I have often been pleased with seeing the care taken of the young Swans by the parent birds. Where the

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* Mr. Stevenson (Zool. 1883, p. 37) mentions twelve young hatched out in a single brood; and states that a female, for several years in succession, reared ten and eleven young.

stream is strong, the old Swan will sink herself sufficiently low to bring her back on a level with the water, when the cygnets will get upon it, and in this manner are conveyed to the other side of the river, or into stiller water. Each family of Swans on the river has its own district; and if the limits of that district are encroached upon by other Swans, a pursuit immediately takes place, and the intruders are driven away. Except in this instance, they appear to live in a state of the most perfect harmony. The male is very attentive to the female, assists in making the nest, and when a sudden rise of the river takes place, joins her with great assiduity in raising the nest sufficiently high to prevent the eggs being chilled by the action of the water, though sometimes its rise is so rapid, that the whole nest is washed away and destroyed."

The family continue to associate through the winter, but the following spring the parent birds drive away the young of the previous year, and oblige them to shift for themselves. Their food consists of the softer parts of water plants, roots, aquatic insects, and occasionally small fish; also grain and bread.

The Swan being identified with Orpheus, and called also the Bird of Apollo the god of music, powers of song have been often attributed to it, and as often denied. It is, however, perfectly true that this bird has a soft low voice, rather plaintive and with little variety, but not disagreeable. The Author has often heard it in the spring, and sometimes later in the season, when the bird was moving slowly about with its young. Colonel Hawker, in his sporting work (p. 261), has printed a few bars of the "Swan's melody, formed with two notes, C, and the minor third (E flat), and the musician kept working his head as if delighted with his own performance."

The Mute Swan is generally looked upon as a domesticated bird, and the individuals which are occasionally shot in winter are assumed to have strayed from their usual haunts. This is not necessarily the case, for the Mute Swan still breeds in a perfectly wild state at no greater distance than

Denmark and the south of Sweden; while both wild and half-protected birds are found in many parts of Germany. Wild birds nest in considerable numbers in Central and Southern Russia, and in the valley of the Lower Danube; also, sparingly, on some of the lakes in Greece; more abundantly in the vicinity of the Black Sea and the Caspian; and in Turkestan. In winter, wild birds occur from time to time throughout the greater part of Europe down to the basin of the Mediterranean; and the lakes of Algeria and Egypt are frequently visited by them. The range of this species can be traced to south-eastern Siberia, and to the north-west of India.

Swans, it is said, were first brought into England from Cyprus, by Richard I., who began his reign in 1189; and they are particularly mentioned in a MS. of the time of Edward I. (1272). Paulus Jovius (1543) says that he never saw a river so thickly covered with Swans as the Thames; Turner notices the Swan with the black tubercle on the beak, in his 'Avium Historia,' published in 1544; and Sibbald (1684), includes it in his Fauna of Scotland. In 1625, John Taylor, the water-poet, made a voyage in his wherry from London to Christchurch, and thence up the Avon to Salisbury, to ascertain if there were any impediments to navigation; and "as I passed up the Avon," he tells us, "at the least 2,000 Swans, like so many pilots, swam in the deepest places before me, and showed me the way."

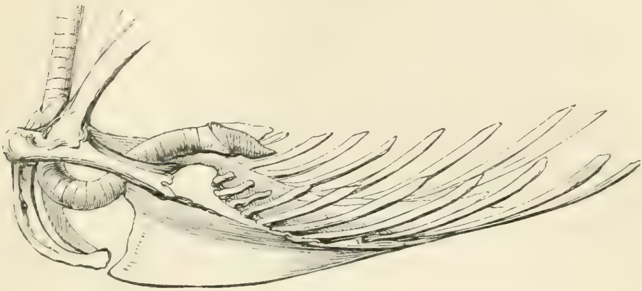
The author of the 'Journal of a Naturalist' mentions having seen more than forty at one time, on the great swan-pool formerly existing near the city of Lincoln. The swannery of the Earl of Ilchester, at Abbotsbury, near Weymouth, in Dorsetshire, is well known, and is the largest in the kingdom; the Rev. A. C. Smith speaks of seven hundred on the occasion of his visit (Zool. 1877, p. 305); and Mr. J. H. Gurney says that when he was there in the following April he was informed by the ancient swanherd that the number was then fully thirteen hundred (Zool. 1878, p. 208). In August 1883, when Mr. Cecil Smith was there, the number had sadly fallen off; but at Weymouth there were quite 300 Swans about the bay and backwater; and a good many on the Exe (Zool. 1883, p. 452). A valuable account of the Mute Swan on the rivers and broads of Norfolk has been printed and privately distributed by Mr. H. Stevenson, in anticipation of vol. iii. of his 'Birds of Norfolk.'

The adult bird has the nail at the point of the beak, the edge of the mandible on each side, the base, the lore, the orifice of the nostrils and the tubercle, black; the rest of the beak reddish-orange; the irides brown; the head, neck, and all the plumage pure white; the legs, toes, and interdigital membranes black.

The whole length of an old male is from four feet eight inches to five feet; the weight about thirty pounds; the black tubercle at the base of the beak is larger than in the female; the neck is thicker, and the bird swims higher out of the water. The body of the female is smaller, the neck more slender, and she appears to swim deeper in the water. This latter point is referable to a well-known anatomical law, that females have less capacious lungs than males, and her body therefore is less buoyant. Marked Swans have been known to live fifty years.

The young Mute Swan, in July, has plumage of a dark bluish-grey, almost a sooty-grey; the neck, and the under surface of the body rather lighter in colour; the beak lead-colour; the nostrils and the basal marginal line black. The same birds, at the end of October, have the beak of a light slate-grey, tinged with green; the irides dark; head, neck, and all the upper surface of the body, nearly uniform sooty-greyish brown; the under surface also uniform, but of a lighter shade of greyish-brown. Young birds at the end of October are nearly as large as the old birds. After the second autumn moult but little of the grey plumage remains; when two years old they are quite white; and breed in their third year.

The figure here inserted represents the windpipe and breast-bone of the Mute Swan. The keel is single, unprovided with any cavity; the windpipe descends between the branches of the forked bone, and curving in the form of part of a circle, passes upwards and backwards to the bone of divarication, and from thence by short tubes to the lungs.



One subject having reference to this species of Swan appears to be so closely connected with its history, that the Author is induced to take a short notice of it, and the more so because it has hitherto been passed over in other histories of the birds of this country. He alludes to the privileges granted to individuals or companies to keep and preserve Swans on different streams; and the many various swan-marks adopted, by which each party might know their own birds. The subject, in all its details, is so extensive that he can afford space for little more than an outline, but this will be sufficient to show the degree of value and importance attached to the possession of the bird, and the authorized power to protect it.

In England the Swan is said to be a bird royal, in which no subject can have property when at large in a public river or creek, except by grant from the crown. In creating this privilege the crown grants a swan-mark.*

A silver swan was the principal device on the badge of Henry IV.; derived from the Bohuns, Earls of Hereford, of which family his first wife was the daughter and co-heiress. Another of his badges was a white antelope. Henry V.

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* The history of Swan-marks forms a literature of its own; and the Editor can only reprint, with slight alterations, the original observations of the Author on this subject. Some interesting details published in 'The Athenæum,' 18th August, 1877, are reproduced in 'The Zoologist' of the same year (p. 445).

before his accession to the throne used the silver swan; afterwards the fire-beacon appears to have been his cognisance. Over his tomb in Westminster Abbey is a representation of an antelope and a swan, chained to a beacon.—*Montagu's Heraldry.*

In the twenty-second year of the reign of Edward IV. (1483), it was ordered that no person, except the king's sons, should have a swan-mark, or 'game' of swans, unless he possessed a freehold of the clear yearly value of five marks.

Sometimes, though rarely, the crown, instead of granting a swan-mark, conferred the greater privilege of enjoying the prerogative right (within a certain district) of seizing White Swans not marked. Thus the Abbot of Abbotsbury, in Dorsetshire, had a 'game' of swans in the estuary formed by the Isle of Portland and the Chesil Bank.

In the eleventh year of the reign of Henry VII. (1496), it was ordered that stealing or taking a Swan's egg should have a year's imprisonment, and make fine at the king's will. Stealing, setting nets or snares for, or driving Grey or White Swans, was punished still more severely.

The king had formerly a swanherd (*Magister deductus cygnorum*), not only on the Thames, but in several other parts of the kingdom. We find persons exercising the office of "Master of the King's Swans," sometimes called the swanship, within the counties of Huntingdon, Cambridge, Northampton, and Lincoln. Richard Cecil, the father of Lord Burleigh, was bailiff of Whittlesey Mere, and had the custody of the Swans in the time of Henry VIII. Anciently the crown had an extensive swannery annexed to the royal palace or manor of Clarendon in Wiltshire. It had also a swannery in the Isle of Purbeck.

In the 'Archæologia,' published by the Society of Antiquaries of London, vol. xvi. 1812, ordinances respecting Swans on the river Witham, Lincolnshire, together with an original roll of ninety-seven swan-marks appertaining to the proprietors on the said stream, were communicated by the late Sir Joseph Banks. A true copy of the Parchment Roll being too long, only the following particulars are here inserted.

No persons having Swans could appoint a new swanherd without the king's swanherd's licence. Every swanherd on the stream was bound to attend upon the king's swanherd upon warning, or suffer fine. The king's swanherd was bound to keep a book of swan-marks, and no new marks were permitted to interfere with old ones. Owners of Swans and their swanherds were registered in the king's swanherd's book.

The marking of the cygnets was generally performed in the presence of all the swanherds on that stream, and on a particular day or days, of which all had notice. Cygnets received the mark found on the parent birds, but if the old Swans bore no mark, the whole were seized for the king, and marked accordingly. No swanherd to affix a mark but in the presence of the king's swanherd or his deputy.

Formerly, when a Swan made her nest on the banks of the river, rather than on the islands, one young bird was given to the owner of the soil, who protected the nest, and this was called 'the ground bird.' A money consideration, instead of a young bird, is still given. When, as it sometimes happened, the male bird of one owner mated with a female bird belonging to another, the brood was divided between the owners of the parent birds; the odd cygnet, when there was one, being allotted to the owner of the male bird.

The swan-mark, called by Sir Edward Coke *cigninota*, was cut in the skin on the beak of the Swan with a sharp knife or other instrument. These marks consisted of annulets, chevrons, crescents, crosses, initial letters, and other devices, some of which had reference to the heraldic arms of, or the office borne by, the Swan owner.

The representations on the next page are swan-marks supposed to be cut on the upper surface of the upper mandible.

Nos. 1 and 2 were the royal swan-marks of Henry VIII. and Edward VI. No. 3 was the swan-mark of the Abbey of Swinstede, on the Witham; and the Author may remark that the crosier, or crook, is borne by the divine, the cowherd, the shepherd, the goatherd, the swanherd, and the gooseherd, as emblematical of a pastoral life and the care of a flock.

No. 4 was the swan-mark of Sir Edward Dimock, of Lincolnshire. The royal champion, it will be recollected, was of this family, who held "the mannour at Scrivelsby in Lincolnshire by that tenure, to come armed on horsebacke (or one in his stead) on the king's coronation day, and in the presence of the king to proclaime and challenge any that shall affirm the king not lawfull heire to the crowne and kingdome, to fight with him bodie for bodie," &c.—*Camden.*

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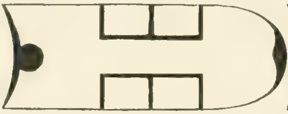

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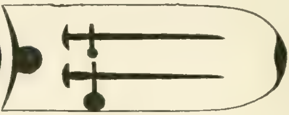

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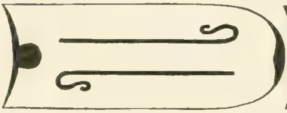

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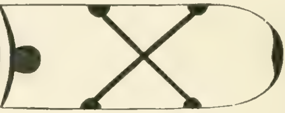

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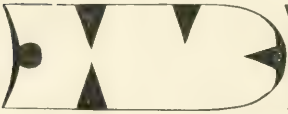

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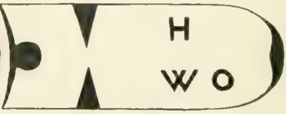

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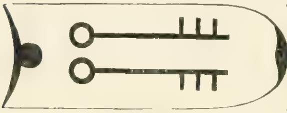

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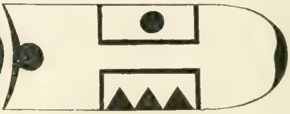

These four swan-marks are from the 'Archæologia.'

No. 5 is the swan-mark of Sir Thomas Frowick, of Gunnersbury, Middlesex, Lord Chief Justice of the Common Pleas; from the Harleian MS. No. 541.

The next three swan-marks are from Mr. A. J. Kempe's 'Losely Manuscripts,' and refer to the time of Elizabeth.

No. 6 is the swan-mark of Lord William Howard, afterwards Earl of Effingham, Lord High Admiral of England, in the reign of Queen Mary.

No. 7 is the swan-mark of Lord Buckhurst; the keys having reference to his office of Chamberlain of the Household. At the time that the Author wrote, the appointment of the royal swanherd's man was vested in the Lord Chamberlain for the time being.

No. 8 is the mark of Sir William More, who was appointed by Lord Buckhurst to the office of Master of the Swans for Surrey, "in such sorte as all the rest of the sheres were graunted." One of the conditions recorded in the grant is as follows: "But this order must be kept that the upping* of all those Swans, near or within the said branches of the Tems, may be upped all in one day with the upping of the Tems, which is referred to Mr. Maylard, of Hampton Courte, who hath the ordering of the Tems. So if it pleas you from time to time to send and confer with him." The following is a copy of a letter from R. Maylard, the Master of the Swans on the Thames, to Sir William More, as Master of the Swans for Surrey, extracted from Mr. Kempe's book:—

"May it please you, Sir, this morning I received a l're affirmed to come from you, but no name thereunto. Wherein yo' request me to come to Perford to confer wt yo' touching the upping of Swanes, w'ch I wold most gladly pforme, yf I were not throughe very ernest busynes letted of my purpose, ffor to morrowe being Tuysdaie I take my jorney along the river of Thames at Gravesend.† And then uphon the first Mondaie in August, I come westward towards Wyndsor. Wherefore if it may please you^{u} to send to my howse to Hampton Court what dais you meane to appointe for driving the river of Weybridge and Molsey, it shall suffice, to th' end the gamesters maie have knowledge thereof, that they may attend accordingly. I do thinke it wold greatly satisffie them yf yo' did appointe the same upon Tuesday the viith of August, for upon that day they wil be at the entrance of these rivers. And so praing you to p'don me for my absence at this tyme, I humbly take my leave. Hampton Court, this Mondaie, xxxth of July 1593. "Yor poore frend to comaunde,

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* Upping, or taking up the young Swans to mark them, now sometimes called Swan-hopping.

† Many Swans were formerly kept below bridge. In ancient views of the port of London, they are usually represented as swimming in that part of the river, and some frequent, or did until very recently, the neighbourhood of Rotherhithe and the Surrey Commercial Docks. In an enumeration of the fees of the Constable of the Tower in 1381–2, the following occurs: "All maner of Swannes that come through the bridge, or beneath the bridge, be clearlie the Constable's, and also there shall [be] noe swanne eyre beneath the bridge, but the owners of the said swannes shall make a fyne for them to the said Constable, and over that, the Constable shall have of every nest a signet."

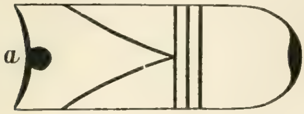
"R. Maylard."

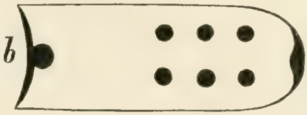
"To the R. W. Sir W. Moore, Kn't,
at Pirforde."

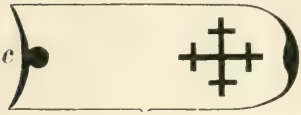
Since the publication of the first Edition of this work, the Author obtained a very rare tract on Swans and swan-marks, printed by A. Matthewes, in 1632, and containing, besides some other illustrations, the swan-mark of Charles I. and his Queen. It is a small quarto of eight leaves only, of the "Orders, Lawes and ancient Customes of Swannes, taken forth of a Book, which the Lord Buckhurst delivered to Edward Clerk, of Lincoln's Inn, Esq., to peruse," on the back of which book it was thus entitled, "Taken out of an ancient Book remaining with Master Hambden, sometimes Master of the Swannes," caused to be printed by John Witherings, Esq., Master and Governour of the Royal Game of Swans throughout England, to whom it is dedicated by John D'Oyly, from Alborn, in Wiltshire, with the plates of the marks used to distinguish the Swans.

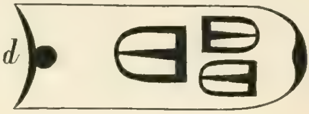
The marks distinguished by the letters *a*, and *b*, are those of Charles I. and his Queen. The next, *c*, and *d*, are those of Oxford and Cambridge. The city of Oxford has a game of Swans by prescription; and in the sixteenth century, when a state dinner was not complete unless a Swan was included in the bill of fare, this game of Swans was rented upon an engagement to deliver yearly four fat

Swans, and to leave six old ones at the end of the term. By the corporation books it also appears that in 1557,









barley was provided for the young birds at fourteen pence a bushel, and that tithes were then paid of Swans. The Author learned also from the late Rev. Dr. Thackeray, Provost of King's College, Cambridge, that the old Munden books of that College contain entries of payments made for feeding Swans.

The most curious books on swan-marks that the Author had ever seen, were two sold at Strawberry Hill in April 1842. They appeared in the catalogue as, "Two books of swan-marks, 8vo. on vellum, very rare." One of them contained 810 marks, the other 80 marks; both books commenced with a royal mark. There was no explanation or description of the different marks: only the name of the party to whom the mark had been appropriated, in the characters of the time of Elizabeth.

No. 9, the first swan-mark of the representations forming the final vignette, is that used to mark the Swans belonging to the corporation of Norwich, on the river Yare.

No. 10 is the swan-mark of the late Bishop of Norwich, formerly President of the Linnean Society, to whom the Author was indebted for the following particulars in reference to the feeding the young Swans of the year for the table. The town-clerk sends a note from the Town-hall of Norwich to the public swanherd, the corporation, and others, who have Swans and Swan rights. On the second

Monday in August, when collected in a small stew or pond, the number annually varying from fifty to seventy, and many of them belonging to private individuals,* they begin to feed immediately, being provided with as much barley as they can eat, and are usually ready for killing early in November. They vary in weight, some reaching to twenty-eight pounds. They are all cygnets. If kept beyond November they begin to fall off, losing both flesh and fat, and the meat becomes darker in colour and stronger in flavour. A printed copy of the following lines is usually sent with each bird:—

TO ROAST A SWAN.

Take three pounds of beef, beat fine in a mortar,
Put it into the Swan—that is, when you've caught her.
Some pepper, salt, mace, some nutmeg, an onion,
Will heighten the flavour in Gourmand's opinion.
Then tie it up tight with a small piece of tape,
That the gravy and other things may not escape.
A meal paste, rather stiff, should be laid on the breast,
And some whited brown paper should cover the rest.
Fifteen minutes at least ere the Swan you take down,
Pull the paste off the bird, that the breast may get brown.

THE GRAVY.

To a gravy of beef, good and strong, I opine,
You'll be right if you add half a pint of port wine;
Pour this through the Swan, yes, quite through the belly,
Then serve the whole up with some hot currant jelly.
N.B. The Swan must *not* be skinned.†

In former times the Swan was served up at every great feast; and occasionally a cygnet is seen exposed for sale in the poulterers' shops of London.

No. 11. Eton College has the privilege of keeping Swans on the Thames, and this is the College swan-mark. It is intended to represent the armed point and the feathered end of an arrow, and is here represented as cut on the door of one of the inner rooms in the College.

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* Bloomfield's History of Norfolk contains representations of numerous swan-marks.

† Mr. Stevenson, in his account of the Mute Swan in Norfolk, already mentioned, says that he has ascertained that these lines were written by a relative of his own, the Rev. J. C. Matchett.

Nos. 12 and 13 are derived from Mr. Kempe's 'Losely Manuscripts,' and represent the swan-marks of the Dyers' and Vintners' Companies of the City of London, as used in the reign of Elizabeth. These two Companies have long enjoyed the privilege of preserving Swans on the Thames, from London to a considerable distance, some miles above Windsor, and they continue the ancient custom of proceeding with their friends and visitors, with the royal swanherd's man, and their own swanherds and assistants, every year, on their Swan voyage, for the purpose of catching and marking all the cygnets of the year, and renewing any marks in old birds that may by time have become partially obliterated.

The forming circles or annulets on the beak, as observed in these two ancient marks, being considered as inflicting more severe pain upon the bird than straight lines, these rings are now omitted, and the lines doubled, as shown in the marks numbered 14 and 15, which are those of the Dyers' and Vintners' Companies as used up to 1878 inclusive: Nos. 12 and 14 being the ancient and modern mark of the Dyers' Company; Nos. 13 and 15, the ancient and modern mark of the Vintners' Company. Since 1878 the two double parallel cuts or bars have been omitted in No. 14, and the V in No. 15.

Mr. Kempe appears to discountenance the popular notion that the sign of the Swan with two *necks* has any reference to the two *nicks* in the swan-mark of this Company; but the sign has been considered a fair heraldic personification of the term; united, as it is, with the following considerations:—that the Swan has been for some hundred of years identified with the Vintners' Company and its privileges; that the principal governing officers of the Company for the time being are, a Master and three Wardens, the junior Warden of the year being called the Swan Warden; that models of Swans form conspicuous ornaments in their Hall; and that the first proprietor of the well-known inn, the Swan with Two Necks, was a member of the Vintners' Company.

No. 16 was the Royal swan-mark which had been used from the reign of George the Third to August 1878, when the three lower diamonds were discontinued.

The following, taken from 'The Field,' August 9th, 1884, gives the result of the last Swan-upping on the Thames:— "The Queen's swanherd and the officials of the Vintners' and Dyers' Companies of the City of London have just concluded their annual excursion upon the Thames for the purpose of marking or 'nicking' the Swans and Cygnets in the upper reaches of the river between Southwark Bridge and Henley. There were 40 Swans and 2 Cygnets between London and Ditton, 39 Swans and 12 Cygnets between Ditton and Staines, 65 Swans and 25 Cygnets between Staines and Bray, and 123 Swans and 24 Cygnets between Bray and Henley. The total number of Swans was 267 and Cygnets 63. Of these the Queen claims 176 Swans and 46 Cygnets; the Vintners' Company, 48 Swans and 12 Cygnets; and the Dyers' Company, 43 Swans and 5 Cygnets. The number of the 'inland' birds—those which have strayed up the tributaries of the Thames—has yet to be ascertained."

In the language of swanherds, the male Swan is called a Cob, the female a Pen: these terms refer to the comparative size and grade of the two sexes; the young, during their first year, are called Cygnets; during the second, Grey-birds; afterwards, their plumage being perfect, White Swans. The black tubercle at the base of the beak is called the berry, and a Swan without any mark on the beak is said to be clear-billed.

For a reference to the various statutes, laws, orders, &c., on Swans and swan-marks, see the article Swan, written by Mr. Serjeant Manning, in the Penny Cyclopædia, from which the Author has made some short extracts.

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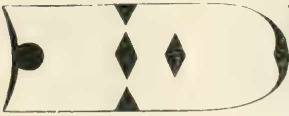

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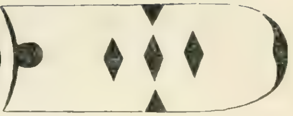

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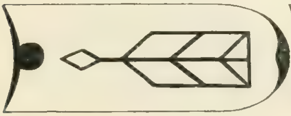

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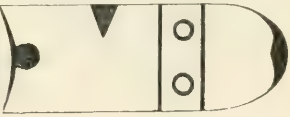

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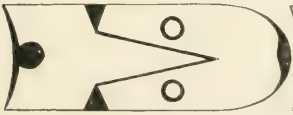

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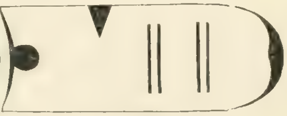

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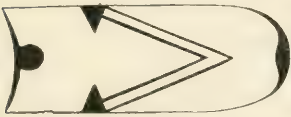

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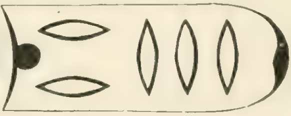

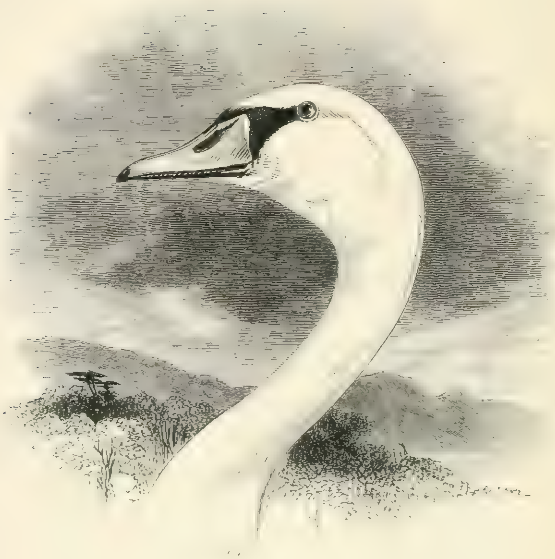

CYGNUS IMMUTABILIS, Yarrell.*

THE POLISH SWAN.

Cygnus immutabilis.

SOME of the London dealers in birds more than forty years ago appear to have been in the habit of distinguishing a large Swan, which they said they received from the Baltic, by the name of the Polish Swan. The Author had reason to believe that this Swan would prove to be a distinct species, though even more nearly allied externally to our Mute Swan, than the Bewick's Swan is to the Whooper. In the spring of 1836 the Ornithological Society of London purchased of the late Mr. Castang, the dealer in birds, a pair of these Polish Swans, with one cygnet of their own brood, which was white. This appeared to be a specific peculiarity worthy of consideration; the parent birds were remarkable besides in having the legs, toes, and their intervening membranes of a pale ash-grey colour; the black tubercle at the base of the beak was of small size; and the elongated openings in the nostrils did not reach the black colour at the base of the beak, on each side, but were entirely surrounded by the orange colour of the beak, as shown in the representation. Unfortunately, both the old female and the young bird died in the following winter. The old male had but a small tubercle at the base of the beak, and his legs and feet, though a little darker than formerly, continued of a pale slate-grey. This bird did not pair, and could scarcely be said to associate with any of the Mute Swans on the same water.*

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* Pr. Zool. Soc. 1838, p. 19.

In the severe weather of January and February, 1838, Swans of all sorts were unprecedentedly abundant; and several specimens were obtained out of flocks of these Polish Swans which were seen pursuing a southern course along the line of our north-east coast, from Scotland to the mouth of the Thames. The specimen which the Author exhibited at the evening meeting of the Zoological Society, belonged to the Rev. L. B. Larking, of Ryarsh Vicarage, near Maidstone, and was one of four shot on the Medway, near Snodland Church, where a flock of thirty and several smaller flocks were seen.

The circumstance of these flocks being seen without any observable difference in the specimens obtained, all of which were distinct from our Mute Swan; the fact also that the cygnets, so far as then observed, were of a pure white colour, like the parent birds, and did not assume, at any age, the grey colour borne for the greater part of the first two years by the young of the other species of Swans, induced the Author to consider this Swan entitled to rank as a distinct species, and, in reference to the unchangeable colour of the plumage, he proposed for it the name of *Cygnus immutabilis*.

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* About 1852, the thirteenth Earl of Derby having only a female of the Polish Swan, and the Ornithological Society still possessing their solitary old male, the latter was sent to Knowsley, to form a pair. Four cygnets were produced, which were white when hatched, and remained so. At the sale of the Knowsley collection the two old birds were purchased by Mr. Bartlett for the Ornithological Society, and placed on the lake in St. James's Park. They produced a brood of seven cygnets in the summer of 1854, and another of six in 1855, which were all white from the egg. A male Polish Swan paired with a Mute Swan at Knowsley, and a brood was produced. A Polish Swan also paired with a Mute Swan on the waters in the Phœnix Park devoted to the use of the Dublin Zoological Society.

The organ of voice appeared, from one that the Author examined, to be like that of the Mute Swan; but his opinion as to the specific distinctness of the Polish Swan was strengthened by a paper pointing out some differences in the form of the cranium, published by Mr. Pelerin (Mag. Nat. Hist. 1839, p. 178), from which the following is an extract:—

"The measurement of an adult cranium of each is as follows:—Length, from the tip of the bill to the base of occipital bone in *C. immutabilis*, six inches and three-eighths; *C. olor*, six inches and seven-eighths. Height, from the bottom of the lower mandible when closed, to the top of the protuberance at the base of the bill, in *C. immutabilis*, one inch and five-eighths; *C. olor*, two inches. Height, from the base of the under jaw to the vortex of the head, just behind the orbit of the eye, in *C. immutabilis*, two inches and one-eighth; *C. olor*, two inches and a quarter. In *C. immutabilis* the bill is rather more flattened, particularly in the middle, between the *dertrum*, or nail, and the nostrils; the protuberance at the base of the upper mandible is less developed. In the Polish Swan the cranium is highest at the supra-occipital portion; in the Mute Swan the cranium is highest at the supra-orbital portion; but the greatest difference is perceptible on comparing the occipital bones; the upper portion of this bone in *C. immutabilis* protrudes considerably more, and there are two oval *foramina*, one on each side just above the *foramen magnum*, which are not present in any specimens of *C. olor* that I have examined; the portion forming the boundary of the external orifice of the ear is much more prominent, and the condyle forms a more acute angle with the basilar portion of the occipital bone."

The Author verified all Mr. Pelerin's observations.

The Author heard of one Polish Swan said to have been shot in Cambridgeshire, and now preserved in the Wisbeach Museum; but Mr. H. Stevenson believes that this bird was really obtained in Norfolk in 1839. In a valuable paper in anticipation of vol. iii. of his 'Birds of Norfolk,' he mentions eight more individuals obtained in various years in that county; but he considers that some, if not most, had escaped from private waters. One out of two, shot in the great Swan year, 1855, was examined and identified by the Author. In February 1861 Mr. J. E. Harting examined a bird, which he identified as a Polish Swan, hanging up in Leadenhall Market. In the British Museum there is a young male (by dissection) shot at Nairn, Scotland, on the 27th September, 1872, and presented by Lord Holmesdale. Other examples have probably been obtained, but not distinguished; and, in fact, the validity of the species is by no means universally, or even generally, admitted.

In spite of the statements of the dealers half a century ago, as to the receipt of this bird 'from the Baltic,' Mr. Dresser, writing in 1880, expressly states that he could obtain no reliable information respecting the occurrence of the Polish Swan on the Continent. Subsequently Dr. Stejneger, in his important monograph of the Swans, already mentioned, states that he has identified with this species a bird of the year, in the Leiden Museum, killed on the Haarlem Meer, in December 1840. This is the only Continental example of which even Dr. Stejneger has any cognizance. He is, on the whole, inclined to believe in its specific distinctness; he also admits the validity of *Cygnus unwini*, Hume, described from immature Swans shot in January 1871 in north-western India; and Dr. Stejneger has further bestowed the name of *Cygnus pelzelni* on a knobless Swan—one of three taken alive in March 1856 on Lake Menzaleh, Egypt—which died in confinement at Vienna in 1857. In the absence of adequate materials, the Editor is unable to follow or to pronounce an opinion upon these subtleties of distinction. Even as regards the Polish Swan, he must limit himself to reproducing the summary of evidence in favour of its specific distinctness as set forth by Mr. T. Southwell, one of its warmest and most capable advocates.

"Since Mr. Stevenson's excellent monograph ('The Polish Swan,' printed for private circulation) was written, I have had additional opportunities of examining Norfolk-killed specimens of the Polish Swan; and other important evidence has been accumulated, which tends greatly to strengthen my previous opinion, that the so-called *Cygnus immutabilis* is really a true species. The Polish Swan has actually been bred in confinement by Lord Lilford, producing white cygnets; and from these white cygnets his Lordship has again bred another generation of white cygnets. Lord Lilford does not appear to have recorded this; and it was only in the course of conversation that it came to light. Upon being applied to by Mr. Stevenson, his Lordship kindly wrote him full particulars of the occurrence, and at the same time expressed his decided opinion that the species is a good one. Before, however, this was known, the Council of the Zoological Society, finding that the pair in their possession mentioned by Mr. Stevenson, did not breed in their confined home in the Gardens, determined to intrust them to Mr. J. H. Gurney, hoping that more liberty and a change of quarters might induce them to breed. In the spring of the present year they were accordingly sent to Northrepps, where they at once settled, and in due time made a nest, and out of six eggs produced five young ones—three on the 21st, and two on the 22nd of May; these were a delicate buff-colour when hatched, which gradually faded to pure white. When I first saw them on June 2nd, the buff tinge was hardly perceptible, except on the back, which appeared of a rich creamy-buff, with the under parts nearly pure white. On the 27th July, Mr. Gurney wrote me, that the cygnets were beginning to show some feathers, which were 'dull cinnamon-brown, much like the first down.' About the 10th of August the most backward and smallest cygnet died; the tail-feathers then showing were pale yellowish-buff; the wing-coverts the same colour; all the other parts from which the down has not yet been moulted, pure white. On the 20th of August I again saw three of the cygnets; they had then assumed nearly all their feathers, and were more than half-grown; the colour was white, apparently stained or sullied by a yellowish tint, which was strongest on the wing-coverts; feet pale ash-colour, and beak a purplish flesh-colour, differing entirely from the lead-colour of the bill in the young Mute Swan of the same age. The colour of the feet did not differ greatly from that of the young of the Mute Swan; and I agree with Mr. Stevenson, that at no stage of growth is this a character to be depended upon. When the breeze lifted the feathers upon the back of the young birds the buff tinge was more visible. There were also several peculiarities about the head, with which, although very important, I will not trouble you.

"I think it may be taken as proved that there is a Swan which produces white or nearly white cygnets. With regard to Professor Westerman's remarks to Mr. Gurney, that he had known a brood of mixed cygnets in Holland, and other instances recorded in 'The Field' for July 8th, 1871, in which a pair of Swans in Wales produced three white cygnets in a brood of the usual colour in one year, and a single one in another—the only instances of mixed broods I have ever heard of—I would say that I have very little doubt one of the parents in each case was a Polish bird, or that they were of mixed blood. From the fact of more than one Polish Swan killed in this neighbourhood having been partially pinioned, I am led to believe that, although others have been undoubtedly wild specimens, there are birds of this species at large on our waters unknown to their owners, and that various degrees of infusion of Polish blood may account for individuals which I have observed in several ornamental waters partaking more or less of the characters of both species. Mr. J. H. Gurney, jun., has told me of such birds on the Serpentine, and at Gatton Park; I have noticed others; and one on the lake in Battersea Park, so far as I had an opportunity of observing it, appeared to me to be almost a pure Polander.

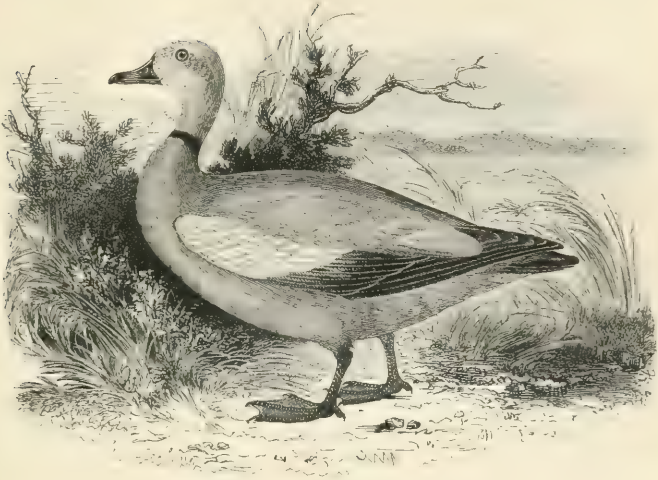
"From what I have just said, mixed broods, or cygnets varying in colour, are just what we might expect; but so far from this being the case, I never could hear of any variation. Seventy cygnets now in the Swan-pit are as much alike as it is possible for them to be. Mr. Simpson, who has had from seventy to a hundred through his hands yearly for the past thirty years, never saw a white cygnet. From this, I think, we may conclude that, if there is a mixture of blood, the dark colour inherited from the *C. olor* parent is so strong in the cygnet as not to be appreciably affected by the Polish strain, but that the characters which distinguish the Polish breed assert themselves at a later age."

"March 12th, 1877. Mr. Gurney tells me the young Polish Swans are now pure white, with the exception of the crown of their heads, and that from one of the two survivors even this small display of colour has nearly disappeared" (Tr. Nor. Nat. Soc. ii. pp. 258–260).

In the adult bird the beak is reddish-orange; the nail, lateral margins, nostrils, and base of the upper mandible, black; the peculiarity of the nostril has been noticed; the tubercle, even in an old male, is usually of small size; the irides brown; the head, neck, and the whole of the plumage, pure white; legs, toes, and intervening membranes, slate-grey.

From the point of the beak to the end of the tail is fifty-seven inches. From the carpal joint to the end of the second quill-feather, which is the longest in the wing, twenty-one inches and a half; tarsus four inches; middle toe and nail five inches and three-quarters.

Its food and habits closely resemble those of the Mute Swan.



TADORNA CASARCA (Linnæus*).

THE RUDDY SHELD-DUCK.

Tadorna rutila.

TADORNA, *Fleming*†.—Beak about the length of the head, higher than broad at the base, depressed or concave in the middle; breadth nearly equal throughout; under mandible much narrower than the upper, the latter grooved near the tip; nail decurved, forming a hook; both mandibles furnished with thin transverse lamellæ. Nasal groove near the base of the beak; nostrils oval, lateral, pervious. Legs moderate; the tibia naked for a short space above the tarsal joint; toes three in front, entirely webbed; one behind free. Wings of moderate length, the second quill-feather the longest. The sexes nearly alike in plumage.

THE Author has adopted the genus *Tadorna*, instituted by Fleming, for the reception of the Sheld-Ducks, a well-marked Old World group consisting of seven known species, and especially abundant in the Indian and Australian regions. In some respects its members resemble the Geese,

* *Anas Casarca*, Linnæus, Syst. Nat. Ed. 12, iii. App. p. 224 (1768).

† Philosophy of Zoology, ii. p. 260 (1822).

particularly in the circumstance of the females being very nearly of the same colour as the males in plumage, which is not the case in the true Ducks. In several points the Ruddy Sheld-Duck resembles the Egyptian Goose, with which it has been known to breed; and it has even been called the Ruddy Goose.*

Mr. G. T. Fox, of Durham, appears to have first noticed this bird as British, from an example in the Museum at Newcastle, which had belonged to Marmaduke Tunstall, and was believed to have been killed at Bryanstone, near Blandford, in Dorsetshire, in the severe winter of 1776. Selby mentions a specimen in his own collection, killed in the south of England, which was at first lent to him by Gould to figure from. In January, 1834, a specimen was shot at Iken near Orford, Suffolk, which passed into the possession of Mr. Manning, of Woodbridge; and, from the description given, Mr. Hele believes in the reported occurrence of another in that county in 1864. Mr. W. Eagle Clarke was informed by Mr. H. B. Hewetson of one killed near Cottingham, in Yorkshire, some years ago. In two instances, according to Mr. J. H. Gurney, jun., birds were shot in Norfolk which were subsequently proved to have escaped from semi-domestication, and it is extremely probable that this has been the case with some of the other occurrences on record. Mr. Thomas Parkin has recorded one shot in Romney Marsh, Kent, on the 8th September last (Zool. 1884, p. 469).

In Scotland a Ruddy Sheld-Duck is stated by Messrs. Baikie and Heddle to have been killed at Sanday, in Orkney, in October 1831; and, according to Mr. R. Gray, one shot in Caithness-shire is still preserved in the collection which belonged to the late Mr. Sinclair of Wick. In Ireland, as stated by Thompson, one formerly in the Warren collection, and now in the Dublin Museum, was shot on the Murrough of Wicklow on the 7th July, 1847; another, in the same Museum, was obtained more recently in co. Waterford; an example, doubtfully Irish-killed, is in Trinity College, Dublin; and a young male in the collection of Mr. Neligan of Tralee, co. Kerry, was shot there on the 17th August, 1869.

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* "'*Sheld*, flecked, party-coloured;' (Coles, 1684.) M. E. *sheld* is a shield; and the allusion is to the ornamentation of shields." Skeat's Etym. Dict. p. 431. Willughby, speaking of the next species by the name of 'Sheldrake,' says that it is so called because it is parti-coloured; and it may be borne in mind that the term is often applied to the Red-breasted Merganser, Goosander, and other birds of pied plumage. *Cf.* J. H. Gurney, jun., Zool. s.s. p. 4846.

Either as a straggler, or having escaped from confinement, a Ruddy Sheld-Duck was shot near Stockholm, in May 1854; and, from the description given, Prof. Palmén has identified with this species a Duck shot on the Finland side of Lake Ladoga. One is said to have been killed on the island of Bornholm in the Baltic; but it appears to be as yet unrecorded from the coasts of Germany, Holland, Belgium, and the north of France, although, in the south of the last-named country, several examples have been obtained near Toulouse. To the north of the Alps and Carpathians it is, in fact, of exceedingly rare occurrence; nor can it be said to be abundant in the south-west of Europe, although it breeds in small numbers in the extreme south of Spain. It is very rare on the mainland of Italy; somewhat less so in Sicily; and a straggler to Malta. East of the Adriatic it becomes more numerous; nesting in Macedonia; and, abundantly, on the Lower Danube; also in Turkey, and Southern Russia, but migrating from the northern shores of the Black Sea and the Caspian when the cold weather sets in. It may be said to be resident in suitable localities throughout the northern part of Africa, including the Sahara; in Egypt; Asia Minor; Palestine; and Persia. Its breeding-range extends through Turkestan and Central Asia to Baikalia and Mongolia, up to a little beyond 50° N. lat. In winter it visits the more southern portions of the Chinese Empire; and there is evidence that it occurs in Japan. It is very common during the cold season in many parts of India, where it is known as the 'Brahminy Duck'; and it breeds in the Himalayas, Tibet, and Kashgaria, up to an elevation of 16,000 feet.

The Ruddy Sheld-Duck makes its nest in a hole; sometimes in the middle of a corn-field, or in a Marmot's burrow on the plains; at others, in clefts of precipitous rocks, as in Algeria and in Palestine, where Canon Tristram found nests amongst those of Griffon Vultures, &c. In Southern Russia hollow trees are said to be selected, the male bird keeping watch on a branch while the female is sitting; felled hollow logs, and deserted nests of birds of prey are also utilized; and, according to Col. Prjevalsky, the female sometimes lays her eggs in the fireplaces of villages abandoned by the Mongols, becoming almost black with soot while sitting. The eggs, from nine to sixteen in number, are laid on the down plucked from the breast of the bird; smooth, creamy-white in colour, measuring about 2·6 by 1·8 in. The male does not share the task of incubation, but afterwards he is very assiduous in his attentions to the young. The female is said to carry the nestlings to the water.

The call-note, when uttered on the wing, is described by Pallas as resembling a clarionet-like *à-oung*, whence the name of *Aangir* given to the bird by the Mongols, who hold it sacred; and *Ahngoot*, by the natives of the vicinity of Lake Van, in Armenia. According to a Hindoo legend, as given by Jerdon, the birds represent two lovers talking to each other across a stream at night—"Chakwa, shall I come? No, Chakwi. Chakwi, shall I come? No, Chakwa." In confinement the note is a sort of *kape* or *ka*, several times repeated. In its manner of walking this species resembles a Goose, and it feeds in a similar manner, grazing in the fields of young corn, and picking up seeds of grass, grain, &c. In summer the birds go in pairs, but at other times they are gregarious, and Jerdon says that on the Chilka Lake he has seen thousands in one flock in April.

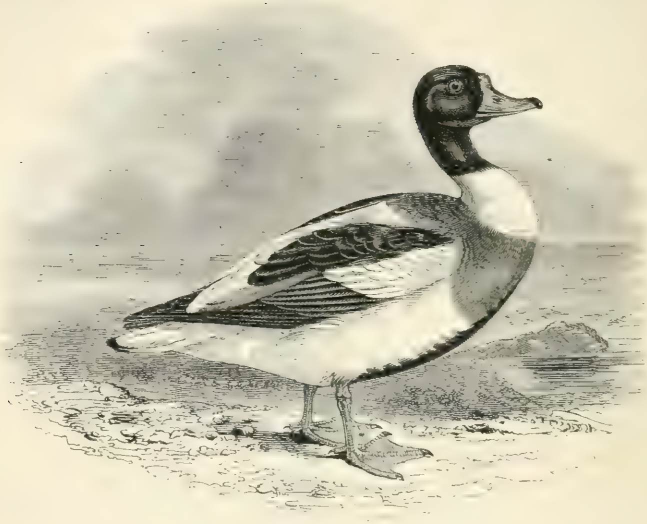
Mr. P. L. Sclater says that the Zoological Society received a pair from Egypt in 1850, which bred for the first time in 1859, and from that year to 1874 inclusive, eleven broods were hatched in the months of May and June (P. Z. S. 1880, p. 512).

In the adult male in spring the beak is lead-colour; the irides yellowish-brown; head, cheeks, and chin, buff-colour, darkening to an orange-brown at the lower part of the neck;

towards the bottom of the neck a ring of black, which is absent from autumn to spring; the back, breast, and all the under surface of the body, the same rich orange-brown; the point of the wing, and the wing-coverts, pale buffy-white; wing-primaries lead-grey, almost black; secondaries rather lighter in colour, the outer webs, short of the end, forming a brilliant bronze-green speculum; rump and tail-feathers lead-colour; legs, toes, and their membranes, blackish. The whole length is twenty-five or twenty-six inches; wing, from the carpal joint to the tip, about fourteen and a half inches.

The female is rather smaller; has a whitish forehead, and no black collar; this latter ornament being also absent in the young male. The young of the year are like the female, but rather duller in colour; the inner secondaries and scapulars are brown, marked with rufous; and the wing-coverts are greyish-white.

A nestling from the Volga, in the collection of Mr. E. Bidwell, is dull white on the forehead, cheeks, and entire under-parts; the crown of the head to the eye, nape, and back, brown, with broad streaks of white on the inner side of each pinion, and on each side of the centre of the rump.



TADORNA CORNUTA (S. G. Gmelin*).

THE COMMON SHELD-DUCK,

OR BURROW DUCK.

Tadorna vulpanser.

THE SHELD-DUCK is one of the most beautiful in appearance of our ornamental water-fowl; the various colours of its plumage being pure, brilliant, and strongly contrasted. This species differs greatly from its congener last described, it being rarely seen far from water. Some are to be found on the sea-coast during the whole year, preferring flat shores, sandy bars, and links, where they breed in rabbit burrows or other holes in the soft soil, whence the name of 'Burrow Duck,' and 'Bar-gander.' In Scotland it is called 'Skeeling Goose,' according to Sibbald, and other writers since his time; also 'Stock-Annet.' Many Sheld-Ducks come from the north to visit this country for the winter, for this species is rather intolerant of cold.

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* *Anas cornuta*, S. G. Gmelin, Reise. d. Russl. ii. p. 185, pl. 18 (1774).

The Sheld-Duck still breeds sparingly in the rabbit burrows and sand-hills upon the coast of Suffolk, Norfolk, Lincolnshire, Yorkshire, Durham, and Northumberland; also in suitable localities along the east coast of Scotland, where large flocks are observed in winter along the sandy estuaries. To Shetland it is a rare visitor at any season; but is more common in Orkney, where, Dr. Patrick Neill says, "it has got the name of Sly Goose, from the arts which the natives find it employs to decoy them from the neighbourhood of its nest: it frequently feigns lameness, and waddles away with one wing trailing on the ground, thus inducing a pursuit of itself, till, judging its young to be safe from discovery, it suddenly takes flight, and leaves the outwitted Orcadian gaping with surprise." It is numerous in summer in the Hebrides, where it is known as the 'Strand-Goose,' and also in some districts on the west side of the mainland. The increase of population has, of course, acted unfavourably to it in the north-west of England, but it still breeds along the sandy coasts of Lancashire, Cheshire, and many parts of Wales. In Cornwall, according to Rodd, it is only a winter visitant; but a few nest in Devonshire, Somersetshire, and near Poole Harbour in Dorsetshire.

In Ireland this handsome species appears to have been driven by persecution, reclamation of waste land, and other causes, from many of the breeding-haunts in the north, and north-east mentioned by Thompson, especially those in the neighbourhood of Belfast. Where unmolested, however, it still nests in suitable localities, among which may be mentioned the sand-hills of Bartragh, co. Mayo, owing to strict preservation by the owner, Capt. Kirkwood; the Saltees, portions of the Wexford coast, Dungarvan and Tramore Bays, co. Waterford, as the Editor is informed by Mr. R. J. Ussher.

The Common Sheld-Duck is only a rare straggler to the Færoes; but it breeds along the coast of Norway up to about

70° N. lat., and, abundantly, in Sweden, Denmark, and on the coasts and islands of the Baltic. It is said to nest occasionally on the sandy shores of some of the inland waters of Germany, and also of Russia. It breeds in Holland, especially on the North Frisian Islands; also on the coasts of France; and, sparingly, in the Iberian Peninsula. Prof. Giglioli thinks that a few remain to breed in Italy, where the bird is by no means rare during the colder portions of the year; and it occurs on passage in Malta and other islands of the Mediterranean, and throughout the entire basin of that inland sea; although on the southern and eastern portions it is, as a rule, less abundant than the Ruddy Sheld-Duck, which is there the representative species. Eastwards its range extends across the temperate portions of Asia as far as Japan; it is believed to breed in Mongolia; and its winter visits to China and India extend about as far south as the Tropic of Cancer.

The Sheld-Duck breeds, as already stated, in some kind of burrow, which often describes an imperfect circle; the nest being sometimes ten or twelve feet from the entrance. It is composed of bents of grass, and is gradually lined, during the progress of laying, with fine soft down, little inferior to that of the Eider Duck, and collected in some places for its commercial value. The eggs are of a smooth shining white, and measure about 2·75 by 1·9 in. The nest may sometimes be discovered by the print of the owner's feet on the sand, but the wary bird will often fly straight into the entrance without alighting outside. The old bird is sometimes taken by a snare set at the mouth of the burrow, and the eggs being hatched under domestic hens, the birds thus obtained are kept as an ornament on ponds.

On the North Frisian Islands, according to Mr. Durnford, the natives make artificial burrows in the sand hillocks, and cut a hole in the turf over the passage, covering it with a sod, so as to disclose the nest when eggs are required. There are sometimes as many as a dozen or fifteen nests in one hillock within the compass of eight or nine yards. The eggs are taken up to the 18th of June, after which the birds are allowed to incubate ; but the nest is never robbed of all the eggs. Naumann, who had already given a similar account of the way in which these birds are farmed in the island of Sylt, states that if no eggs are taken the same bird never lays more than sixteen ; but if the first six eggs are left, and all those subsequently laid are taken, she will continue laying up to thirty. Some German authorities state that nests have been found in the 'earths' of the Fox and the Badger.

Incubation lasts about twenty-eight or thirty days, during which time the male watches near at hand. When the young are hatched they follow the parents, and in some situations are carried by the female on her back to the water, where they soon learn to feed and take care of themselves. The food of this Duck consists of seaweed, mollusks, sandhoppers, sea-worms, and marine insects; the Author found the stomachs filled with very minute bivalves and univalves only, as though the birds had sought no other food. In captivity they feed on grain of any sort, soaked bread, and vegetables. The note is a shrill whistle. The flesh is coarse, dark in colour, and unpleasant in smell and flavour.

As Montagu and other writers have stated that this species does not breed readily in confinement, the following hint may be of service. When the Zoological Society first had a pair of these birds, they exhibited no signs of breeding; but their natural habits being consulted by putting them into a place, where there was a bank of earth in which some holes were purposely made, the birds immediately nested in one of the holes, bringing out a brood in 1835, and again in 1836. In the season of 1841 there was a fine show of young birds, from which the description of the plumage of the birds of the year in their immature dress will be hereafter given ; and broods were hatched each subsequent year up to 1848. The young birds soon become tolerably tame, and answer to the call of the person who feeds them ; when fully fledged, however, they are apt to stray away, and if left unpinioned, generally in time fly entirely off, though they have been known, in some instances, to return after an absence of many months.

Colonel Hawker says, "The young, directly after being hatched in the rabbit-burrows, are taken by the parent birds to the sea, where they may be seen in what the boatmen call troops, of from thirty to forty; but as the female seldom hatches more than fourteen eggs, it is clear that each flock is formed by two or three broods. On their being approached, the old ones fly away, and leave the young to shift for themselves by diving. They may be easily shot when they come up, but you can seldom kill more than one or two at a time, as they always disperse before you can get very near them. You may keep young Burrow Ducks for five or six weeks, provided you give them crumbs of bread, and only a little water three times a day. But if you let them get into the water, or even drink too much before they are full grown, and fit to be turned out on your pond, you are almost sure to kill them."

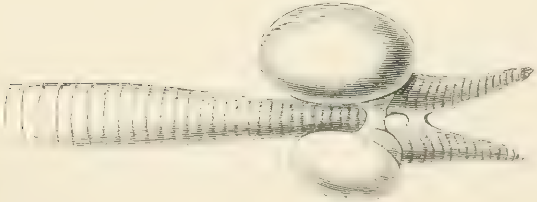
The adult male has the beak and the knob at the base, bright red; irides brown; the whole of the head and upper part of the neck dark glossy green, bounded by a collar of white; followed by a band of rich chestnut covering the upper part of the breast, the space before the point of the wings, and the upper part of the back; the rest of the back, rump, and upper tail-coverts white: scapulars and part of the secondaries nearly black; the long inner secondaries with rich chestnut outer webs; point of the wing and all the wing-coverts white; primaries very dark brown; the speculum of the secondaries green; tail-feathers white, tipped with black; lower central line of the breast and belly rich dark brown; sides, flanks, vent, and under tail-coverts white; legs, toes, and their membranes flesh-pink.

The whole length is from twenty-four to twenty-six inches. From the carpal joint to the end of the wing thirteen inches. The female is rather smaller than the male; less bright in her colours; and has no knob at the base of the bill.

The young of the year in August have the beak flesh-colour; the head and neck brown; chin and front of the neck white; interscapulars and wings brown; wing-coverts white; inner secondaries white, edged with chestnut; primaries black; speculum becoming green; all the under surface white; legs flesh-colour. The young birds do not breed till they are two years old.

The markings of the nestling are like those of the preceding species, but the brown is of a darker tone, and the white of the under parts is purer.

The organ of voice in the Sheld-Duck is distinguished from that of any other genus. The trachea, or windpipe, is about ten inches long, nearly uniform in size throughout its length, except towards the bottom, where, for about one inch, it is much smaller. On each side of the bone of divarication forming the bottom of the tube, there is a globular, hollow, bony protuberance; that on the one side being as large again as the one on the other. The bone is thin, and so flexible when in its moist and natural state as readily to become indented on pressure. The representation given below is only a little smaller than the natural size. The tube below each enlargement, going off, one to each lobe of the lungs, presents nothing remarkable.



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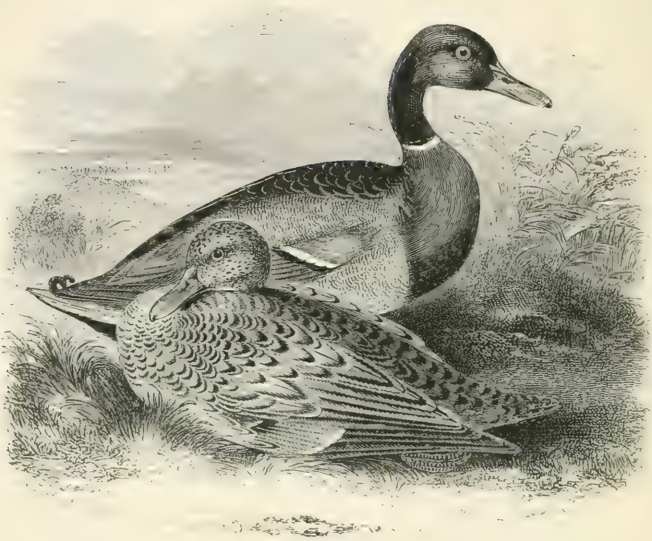

ANAS BOSCAS, Linnæus.[*]

THE MALLARD,

OR WILD DUCK.

Anas boschas.

ANAS, *Brisson*[†].—Bill about as long as the head, broad, depressed, sides parallel, sometimes partially dilated ; both mandibles furnished on the inner edges with transverse lamellæ. Nostrils small, oval, lateral, anterior to the base of the beak. Legs rather short, placed under the centre of the body ; tarsus somewhat rounded ; toes, three in front, connected by intervening membrane ; hind toe free, without pendent lobe or membrane. Wings rather long, pointed. Tail pointed, or wedge-shaped. The sexes differ in plumage.

THE first division of the *Anatinæ* or Freshwater Ducks, as here arranged, will contain the Mallard or Wild Duck,

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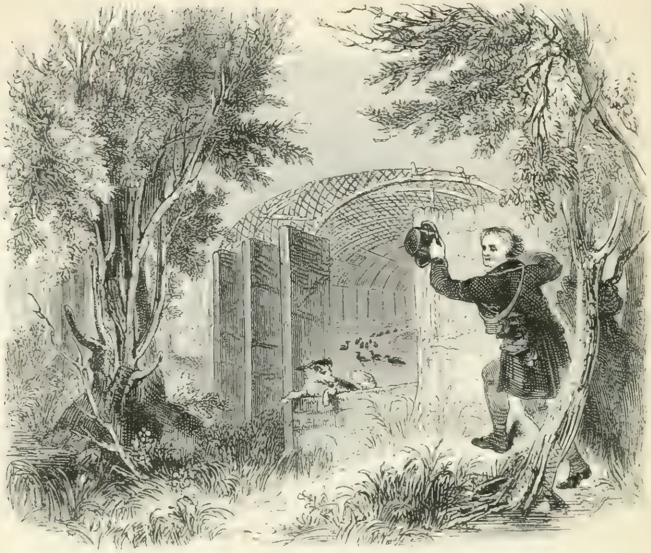
[*] *Anas Boschas*, Linnæus, Syst. Nat. Ed. 12, i. p. 205 (1766). Aristotle uses the name *βοσκάς* for some small species of Duck, and there appears to be no adequate reason for Latinizing it as *boschas*. *Cf.* H. T. Wharton, 'Ibis,' 1879, p. 452.

[†] Ornithologie, vi. p. 307 (1760).

Gadwall, Shoveller, Pintail, Teal, Garganey, and Wigeon, which will be found to have the following characters in common. Externally they exhibit considerable length of neck; the wings are long, reaching nearly to the end of the tail; the tarsi somewhat round; the hind toe free, or having no pendent lobe. In habits they may be described as frequenting water, but passing much of their time on land, feeding in ditches and about the shallow margins of pools, on aquatic plants, insects, worms, and occasionally on small fish; taking their food at or near the surface; possessing great powers of flight, but seldom diving unless pursued. Of their internal soft parts, the stomach is in the greatest degree muscular, forming a true gizzard; the intestines long; the cæcal appendages from six to nine inches in length in the larger birds, decreasing in proportion to the size of the species. Of the bones it may be observed, that the ribs are short, the angle formed by the union of the last pair on each side extending but little beyond the line of the posterior edge of the sternum; the keel of the breast-bone deep, affording great extent of surface for the attachment of large and powerful pectoral muscles; the enlargement at the bottom of the trachea, in all of them, is of bone only. The males of the species of this division are further remarkable for a change in the colours of some parts of their plumage, by which they become, for a time during summer, more or less like their females.

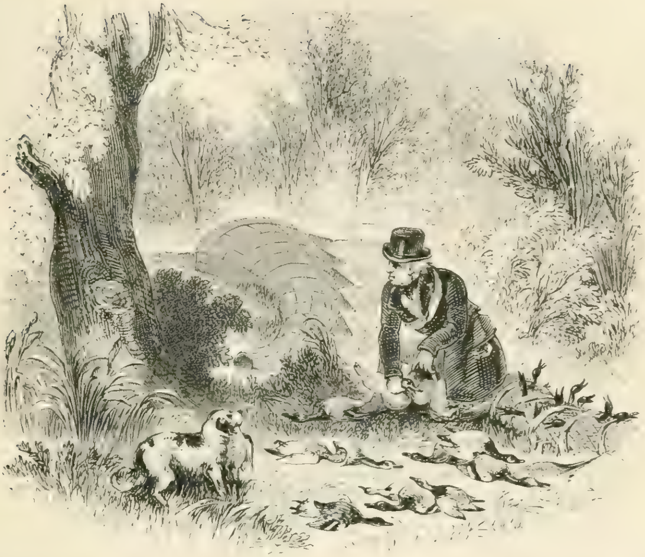
The Mallard or Wild Duck was formerly more numerous in the British Islands than it is at present. To the progress of draining, and the consequent extension of agriculture, this change may be greatly attributed; and although a certain number of this handsome and valuable species still remain to breed—especially since the enforcement of the 'Wild Birds Preservation Act'—they are comparatively few in proportion to the numbers which annually visit this country from eastern and northern latitudes during winter. Particular spots, or decoys, in the fen countries, used to



be rented by the fowlers; and Pennant instances a season in which 31,200 Duck, Teal and Wigeon, were sold in London only, from ten of these decoys near Wainfleet, in Lincolnshire. Even in a recent year, as the Editor is informed by Mr. Cordeaux, 6,321 Duck and Teal were taken at the Ashby Decoy, and of these 2,300 in thirty-one days.

Two illustrations, reduced in size, from designs which appeared in the Penny Magazine, of February 1835, exhibit the screens, the net, and the mode of proceeding, and will enable the reader, with a short description, to understand the process.

The wild birds are enticed from that portion of the lake near the wide open mouth of the tunnel by means of the dog, the decoy Ducks, and the corn used in feeding them, till the decoyman has worked them sufficiently up the pipe to enable him to show himself at one of the openings between the wild birds and the entrance from the lake, the oblique position of the reed screens enabling all the birds in the pipe to see him, while none that are on the lake can. The wild-fowl that are in sight hasten forward, their retreat



being cut off by the appearance of the man, whom they dare not pass. The decoyman then moves on to the next opening, and the wild birds are thus driven along till they enter the tunnel net and are all taken; a twist of the net prevents them getting back. The decoyman then takes the net off from the end of the pipe with what fowl he may have caught, takes them out one at a time, dislocates their necks, hangs the tunnel on to the net again, and all is ready for working afresh.

The Author was indebted to the late Rev. Richard Lubbock for the following account of the mode of making a decoy, supplied him by a friend in Norfolk.

In making a decoy it is necessary to have from an acre and a half to three or four acres of water, in a quiet place surrounded by plantation; the water should be in the form of a star, making six equal divisions of the compass; in these six recesses must be made six pipes: they are constructed by digging cuts in the land something in the form of a semicircle covered over with bows, and a net gradually tapering to the end, at which must be placed a tunnel net, to be taken off when the fowl are driven into it. On each side of the pipe are screens made of reed to shelter the person working the decoy; the outer side of the circle of the pipe is the one on which the person walks who is decoying the fowl, and in the screens on that side must be divisions for the dog to pass over, and also for the man to appear at when driving the fowl.

The water forming the decoy should be surrounded with a fence of reeds three or four feet high to prevent the decoy Ducks from getting out of it. About Midsummer is the time to put them into the water, and commence training them, which is a very important part in the art of decoying; they should be young birds, and made very tame, taught to come to any pipe from all parts of the water whenever they are whistled, and to prevent them flying they should be pinioned.

In working a decoy it is best to go to that pipe at which the wind blows from the tunnel net to the bend of the pipe; by doing so all scent of the person at work is carried away from the fowl in the pipe, and as all wild-fowl by choice rise head to wind, there are generally more taken with the wind in that direction than any other. During the time the weather is open they are taken almost entirely by means of the dog, but as soon as the frost sets in they are taken by feeding them in the pipe, and keeping a piece of water constantly open near it.

The reason in favour of a small piece of water for a decoy, not exceeding three or four acres at the most, is, that when thus confined in extent you can almost always *work* fowl, but if a large lake is made a decoy, there may be thousands of Ducks on the water, but none near enough to a pipe to regard the dog* or the decoy Ducks. Bewick has given a plan of one pipe of a decoy, with zigzag markings showing the situation and position of the screens formed of reeds, by which the fowler and his trained dog are hid from the sight of the wild birds, an outline only of which is here introduced.

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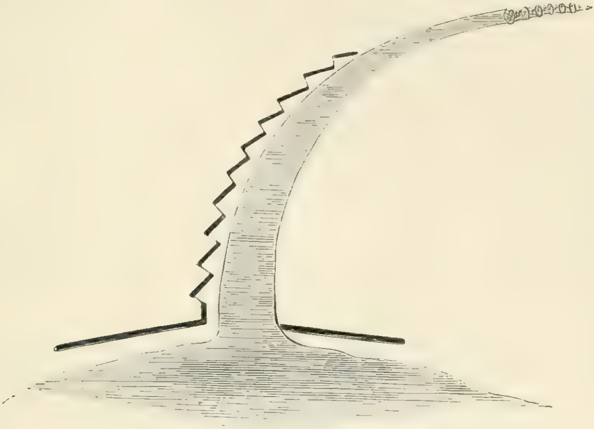
* A well-trained dog moves the birds from the banks when they are sluggish, and is otherwise useful when they are within the mouth of the pipe. He should be small, active, silent, and if of a foxy colour he is likely to prove especially attractive.



Mallards begin to congregate in the decoy soon after Midsummer, but these are the fowl that are bred in the neighbourhood. About the first week in September the Teal begin to come, and about the beginning of October, if easterly winds prevail, there is generally a flight of fowl from foreign countries, composed of Mallards, Wigeon, Dunbirds or Pochards, Teal, with a few Shovellers and Pintails; but the principal flight of foreign fowl does not arrive till the weather becomes severe; at that time all sorts arrive, with the exception of the Garganey, which we do not see before the spring of the year, and then only for the purpose of breeding, if unmolested.*

The Mallard is an early breeder, nesting in March in the southern counties and in mild seasons, and by the middle of April even on the bleak moors of Northumberland; so that the close time commencing on 1st March is by no means too early. The nest, composed of grass, lined with down, is usually placed on the ground, near the margin of rivers or lakes, but often at a considerable distance from water. The Author has known of one in a field of young wheat; sometimes in a thick hedge-row or in a wood, and a stack of faggots is rather a favourite site in semi-populous districts. Occasionally the nest is at a considerable elevation from the ground: one mentioned by Tunstall, at Etchingham, in Sussex, was on an oak twenty-five feet from the ground; the author of the 'Rural Sports' records an instance of a Duck taking possession of the deserted nest of a Hawk in a large oak; Montagu makes mention of one that deposited her eggs in the principal fork of a large elm-tree, and brought her young down in safety; and Selby records an instance, within his own knowledge, and near his own residence, "where a Wild Duck laid her eggs in the old nest of a Crow, at least thirty feet from the ground. At this elevation she hatched her young; and as none of them were found dead beneath the tree, it was presumed she carried them safely to the ground in her bill, a mode of conveyance known to be frequently adopted by the Eider Duck."* The eggs are of a dull greenish-grey colour, smooth on the surface, averaging 2·25 by 1·6 in. The young are two months or ten weeks before they can fly, and formerly advantage was taken of this inability to have, in the fens, an annual driving of the young Ducks before they took wing. Numbers of people assembled, who beat a vast tract, and forced the birds into a net placed at the spot where the sport was to terminate. A hundred and fifty dozens have been taken at once; but this detrimental practice has been abolished by Act of Parliament. (*Pennant.*)

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* *Cf.* Lubbock's 'Fauna of Norfolk' (1845); especially the new edition (1879), with notes and additions by Mr. T. Southwell, the author of an excellent paper on Norfolk Decoys (Tr. Nor. N. H. Soc. ii. pp. 538 555). For more recent practical experiences Sir R. Payne-Gallwey's 'Fowler in Ireland' (pp. 67-94) may be consulted; there are also numerous magazine-articles on Decoys.

The Mallard feeds on grain or seeds, worms, slugs, and insects. As soon as the females begin to sit, the males leave them, and soon after undergo that remarkable change in coloration which has already been referred to, and which is thus characteristically described by Waterton from personal observation :—

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* [These, and other abnormal situations, were considered very wonderful half a century ago, but since then they have often been recorded.—Ed.]

"At the close of the breeding-season the Drake undergoes a very remarkable change of plumage; on viewing it, all speculation on the part of the ornithologist is utterly confounded; for there is not the smallest clue afforded him, by which he may be enabled to trace out the cause of this strange phenomenon. About the 24th of May the breast and back of the Drake exhibit the first appearance of a change of colour. In a few days after this the curled feathers above the tail drop out, and grey feathers begin to appear amongst the lovely green plumage which surrounds the eyes. Every succeeding day now brings marks of rapid change. By the 23rd of June scarcely one single green feather is to be seen on the head and neck of the bird. By the 6th of July every feather of the former brilliant plumage has disappeared, and the male has received a garb like that of the female, though of a somewhat darker tint. In the early part of August this new plumage begins to drop off gradually, and by the 10th of October the Drake will appear again in all his rich magnificence of dress; than which scarcely anything throughout the whole wild field of nature can be seen more lovely, or better arranged to charm the eye of man. This description of the change of plumage in the Mallard has been penned down with great care. I enclosed two male birds in a coop, from the middle of May to the middle of October, and saw them every day during the whole of their captivity. Perhaps the moulting in other individuals may vary a trifle with regard to time. Thus we may say that once every year, for a very short period, the Drake goes, as it were, into an eclipse, so that, from the early part of the month of July to about the first week in August, neither in the poultry-yards of civilized man, nor through the vast expanse of Nature's wildest range, can there be found a Drake in that plumage which, at all other seasons of the year, is so remarkably splendid and diversified."

The Mallard is the undoubted origin of many of the varieties of our domestic Ducks; but whereas the male of the wild species is strictly monogamous, those of our most common domestic forms are polygamous; moreover, the females are very prolific, one Duck having been known to produce a hundred and eighty eggs in one season. The Mallard has bred with the Egyptian Goose, Sheld-Duck, Muscovy Duck, American Dusky Duck, Wigeon, Pintail, Teal, and other species. As remarked by that keen observer, Mr. C. M. Adamson, half-wild breeds get duller in colour; have coarser feet; and gradually the wings, which in a really wild bird reach, when closed, nearly to end of tail, get shorter in proportion to the body. A Mallard is stated by Mr. J. H. Gurney to have lived twenty-two years.

The Mallard may be called resident in Great Britain and Ireland, some being found there at all seasons. It visits Greenland; is abundant in summer in Iceland; and is generally distributed over the whole of Europe, breeding in suitable localities, down to the Mediterranean and Northern Africa. Enormous numbers visit the southern extremities of its range in winter; and its migrations extend to the Canaries, Madeira, and the Azores, a few pairs remaining to breed in the latter group. In Asia it is found wherever the water does not freeze for any length of time, from Turkestan to China and Japan; it breeds in Cashmere; and goes as far south as Calcutta in winter. Its range extends right across the temperate portions of North America; but in the north-east of that continent it is to a certain degree replaced by a closely-allied species, the Dusky Duck, *Anas obscura*, both male and female of which much resemble the female of our bird. In winter the Mallard has been traced as far south as Panama. In the Sandwich Islands there is a distinct species, *A. wyvilliana*, Sclater, which is rather closer to *A. obscura*, and also to *A. superciliosa* of Australia.

In the adult male the bill is yellowish-green; irides hazel; head and the upper half of the neck rich glossy green; below that a narrow ring of white; the neck behind and the back greyish chestnut-brown, becoming dark on the lower part of the back, and bluish-black on the rump and upper tail-coverts; the four middle tail-feathers velvet-black, and curled upwards; the rest lancet-shaped, ash-grey in the middle, margined with white, the outermost feathers having the broader margins; scapulars a mixture of brown and grey; small wing-coverts ash-brown; greater coverts with a bar of white near the end, and tipped with velvet-black; primaries ash-brown; secondaries the same on the inner web, the outer portion towards the end of the outer web rich shining purple, forming a speculum, but bounded by a bar of velvet-black, and tipped with white; inner secondaries pale chestnut-brown, the outer webs darkest in colour; front and sides of the neck below the white ring rich dark chestnut, each feather at the commencement of winter edged with white; breast, belly, vent, and flanks, greyish-white, the sides before and under the wings marked with delicate grey lines; under tail-coverts velvet-black; legs, toes, and their membranes orange-yellow. Total length twenty-four inches, from the carpal joint to the end of the wing eleven inches and a half. Weight, up to 3 lbs. 8 ozs.

The female has the beak greenish-black, light yellow-brown towards the end, the nail black; irides brown; cheeks, head, and neck, pale brown, each feather streaked with black in the middle; scapulars, and the whole of the back of the same two colours, but prettily varied, some of the feathers black in the middle and on the margin, with a light brown band between the two dark colours; tail-feathers the same; small wing-coverts ash-brown; the large coverts white towards the end, and tipped with velvet-black; primaries uniform dark brown; the secondaries the same on the inner web, outer webs forming a purple speculum, ending in a band of black, and tipped with white; inner secondaries dark brown; chin and throat pale brown; lower part of the neck richer reddish-brown, varied with dark brown; breast, belly, vent, and under tail-coverts pale brown, slightly varied with darker brown, which occupies a portion of the centre of each feather; legs and toes orange, the interdigital membranes darker.

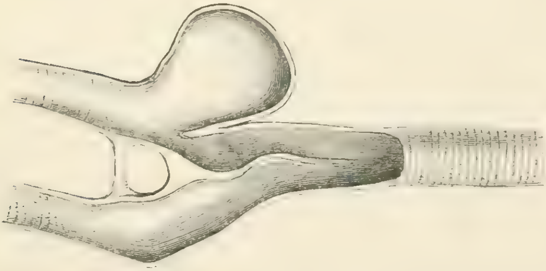
The females are smaller than males, and measure but twenty-two inches in length; the wing ten inches and a quarter.

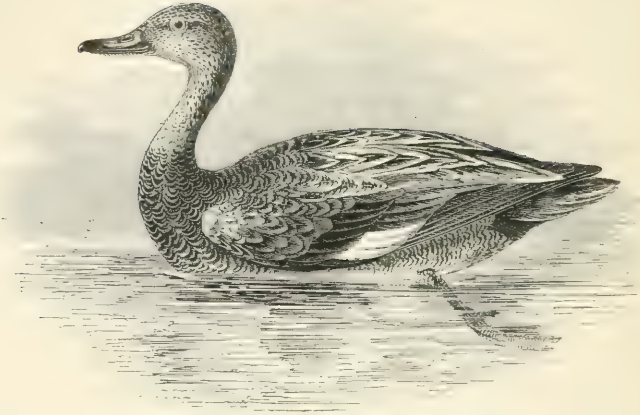
The Author has seen instances in which females of this species have assumed to a considerable extent the appearance of the plumage of the Drake, even to the curled feathers of the tail. One of these birds was given to him when alive by his friend Mr. John Morgan. In this female the beak was yellowish-brown; the head and upper part of the neck a mixture of green and brown; the white ring below perfect; the lower part of the neck and the breast chestnut-brown; the upper surface of the body a mixture of ash-brown and dark brown; the under surface dull white. When this bird was examined after death the sexual organs were found to be diseased, as in the cases of the Hen Pheasants referred to and figured in the third volume, pages 102 and 103. In his 'Scandinavisk Fauna' (pl. 163), Nilsson has given a coloured figure of a Duck in this state of plumage, which is called a barren female, and in which the curled tail-feathers are very conspicuous. From the general similarity in these females to the appearance assumed for a time by healthy males in July, the Author was disposed to refer the seasonal change in the males to a temporarily exhausted state of the male generative organs, and their consequent diminished constitutional influence on the plumage.

Varieties are not uncommon, but complete albino wild birds are very rare.

The windpipe of the Mallard is about ten inches long, the diameter of the tube is of equal size throughout; the bony labyrinth is large, the vignette indicates the form by its outline, but represents a section of the lower part of the tube of the trachea, the bony cavity, and the bronchial tubes, as seen from behind; the enlargement in this, as in most of the other species, being on the left side. The object is to show the course of the air from each lobe of the lungs to the single portion of the tube of the windpipe. The column of air on the right side in the bird, and in the representation, goes direct from the right lobe of the lungs to the tracheal tube; but the column of air on the left side, on passing through the bronchial tube is opposed by the descending edge, and being divided by it, a portion is sent in circles round the inner surface of the cavity before it becomes united with the air from the other lobe in the tube common to both. A compound tone of voice is thus produced by which wild-fowlers can distinguish males from females of the same species, in the darkest night, whenever the birds utter their note, as they frequently do, apparently for the purpose of keeping together. Gilbert White of Selborne, with his usual discrimination, says, in his forty-third letter to Daines Barrington, which is devoted to the consideration of the notes and language of birds:—"among Ducks the sexual distinction of voice is remarkable; for, while the quack of the female is loud and sonorous, the voice of the Drake is inward, harsh, feeble, and scarce discernible."

The resemblance in the vignette below to the reed or other mouth-piece, and the edge opposed to its inner orifice to produce vibration in some musical wind instruments, will be obvious.





ANAS STREPERA, Linnæus.*

THE GADWALL.

Anas strepera.

THE GADWALL, or Grey Duck, is, on the whole, a rare visitor to the British Islands; although, owing to the resemblance of the female and young to those of the Mallard, it has, perhaps, been considered even more uncommon than it really is. Still, the tabulated records of the famous Ashby Decoy, in Lincolnshire, which show the comparative numbers of six species of wild-fowl taken there between September 1833 and April 1868, conclusively prove that between those dates the Gadwall was of very rare occurrence in that part of the east of England; no year showing more than three captures, and many having none at all against them, out of the thousands of Wild Ducks of other kinds.* In Norfolk, however, some thirty years ago the late Rev. John Fountaine transmitted a pair of pinioned birds from his Southacre decoy to the lake at Narford, and not only have their descendants multiplied, but their presence has induced other perfectly wild Gadwalls to remain and breed; so that at the present time, on the carefully preserved estates of Mr. A. Fountaine at Narford Hall, Lord Walsingham at Merton, and others, their numbers may annually be computed, as the Editor is informed, at from fourteen to fifteen hundred on one property alone: not to mention the birds which have spread into the suitable adjacent districts. The increase in their area may be considered to date, in the main, from the time when a much-needed law prohibited the shooting of Wild Ducks in spring; for comparatively few, even of dwellers in the country, seem to have realized how early many species of wild-fowl pair, and that a Duck shot after the beginning of March means a brood less in August. As regards the Garganey, however, the various county records tend to show that, except in Norfolk and one or two spots in the Midlands, it is only an uncommon visitant from autumn to spring; and when found in the London markets, it is usually in April, occasionally in October. Its occurrence in August has been recorded in Radnorshire, but as a rule on the west side of England it is very rare at any time of year.

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* Syst. Nat. Ed. 12, i. p. 200 (1766). This species has been placed by some systematists in a separate genus, *Chaulelasmus*, on account of the lamellæ of the upper mandible being more pronounced than in typical *Anas*; but for the purposes of the present work this distinction appears to the Editor to be unnecessary.

In Scotland, according to Mr. R. Gray, the Gadwall has frequently been met with, both on the east and west coasts; and on the latter it is probably not uncommon. It has been noticed in the islands of the Inner and Outer Hebrides; and Messrs. Baikie and Heddle state that it is an irregular visitant to the Orkneys.

In Ireland, Sir R. Payne-Gallwey considers that Gadwalls are far more frequent in winter than is generally supposed, and he cites a considerable number of occurrences in various districts. They are fresh-water-loving fowl, delighting in weedy or rush-grown lakes and pools; exceedingly shy; and quick at concealing themselves when disturbed; their movements are also nocturnal. Although generally resembling the female of the Mallard, the Gadwall may readily be distinguished by the white speculum on the wing; and in the male the dark mottlings on the breast and flank are very characteristic.

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* 'The Field,' 25th July, 1868; reprinted in 'The Zoologist' for September 1868; also in Mr. Harting's 'Handbook of British Birds,' Introd. p. xxi. (1872).

The late Mr. Procter of Durham obtained a nest of the Gadwall many years ago near Myvatn, in the north-west of Iceland; and in the same locality, in 1862, Mr. G. G. Fowler shot a female as she rose from her two eggs, obtaining a Drake the next day; but the species seems to be rare there. Mr. Meves has shown that a considerable number nest in the south-eastern portions of Sweden; but it is not yet proved that it breeds in Denmark, although known to do so sparingly in Northern Germany, and rather freely in Silesia. It is numerous in Holland and in the marshy portions of Belgium in winter; but in France it appears to be of somewhat rare occurrence on migration. In Spain it is by no means uncommon in suitable localities, and the Editor's statement (Ibis, 1871, p. 396) that it bred near the mouth of the Guadalquivir has been fully confirmed by Mr. Abel Chapman, who obtained the nest, shooting the birds for identification. On the mainland of Italy it is not often met with; but it is common in winter in the marshes of Sicily and Sardinia; and it occurs in the cold season in Malta, the Ionian Islands, and other parts of the Mediterranean. It breeds along the valley of the Danube; also throughout a large portion of Russia, where its range is known to extend as far north as Archangel, whilst in the south-east, both in Europe and Asia, it is said to be resident and abundant. Its migrations extend to the lakes of Northern Africa and up the Nile valley to Nubia.* It occurs in Asia Minor; and in India, as far south as Calcutta, it is one of the most plentiful species during the cold season; it also visits China and Japan sparingly. Northwards it appears to be found across temperate Asia, where it probably breeds in abundance, considering the numbers which visit India.

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* Mr. Layard was assured by the late M. Jules Verreaux that he had once obtained two specimens of this Duck on the Orange River, South Africa; but the species has not been identified there by subsequent observers.

In America this widely diffused species is found throughout the northern portions of that continent, from the Pacific to the Atlantic; its migrations extending to the Bermudas, the West Indian Islands, and Mexico. In the Fanning group, near the Equator and in the middle of the Pacific, it is represented by a distinct species, *Anas* (*Chaulelasmus*) *couesi*.

The Gadwall, like the other Ducks of this division with long and pointed wings, has a vigorous and rapid flight, but, as already remarked, it appears to dislike exposure, and hides itself among thick reeds and aquatic herbage. This was observed to be the habit of a pair in the Gardens of the Zoological Society, which mostly concealed themselves in the long grass on the islands of the ornamental water in which they were confined. This species bred there in the season of 1839, and in many subsequent years down to 1861. In the wild state it usually makes its nest of grass, lined with down, in a dry place at some little distance from the water; the eggs, sometimes as many as thirteen in number, are of a uniform buffy-white, slightly tinged with evanescent green when fresh; and measure about 2·1 by 1·5 in.

The Gadwall feeds on seeds, grain, rice, and other vegetable matter; especially aquatic plants, which it procures by stretching the head down in the water and not by diving; it also devours small crustaceans and fish, frogs, and insects. It usually migrates by night, at a considerable elevation.

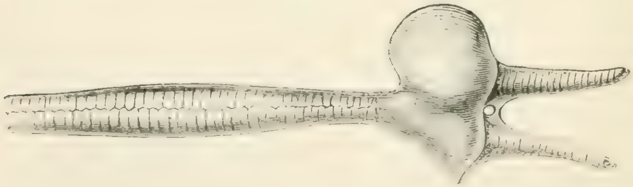
In the adult male the beak is lead-colour; irides hazel; the head and upper part of the neck light brown, speckled with darker brown; back grey, produced by an alternation of darker and lighter coloured grey lines; small wing-coverts chestnut; the greater coverts almost black: primaries brown; the secondaries brown and black, but the outer webs forming a white speculum; inner secondaries pointed, and of two shades of brownish-grey, the darker colour occupying the centre of each feather, the lighter colour forming the margin; rump and upper tail-coverts bluish-black; tail-feathers dark brown, with lighter-coloured edges; lower part of the neck in front, and on the side, dark grey, each feather ending in a half circle of lighter grey; breast and belly white; sides, flanks and vent marbled with two shades of grey; under tail-coverts bluish-black; legs, toes, and their membranes, dull-orange; claws black.

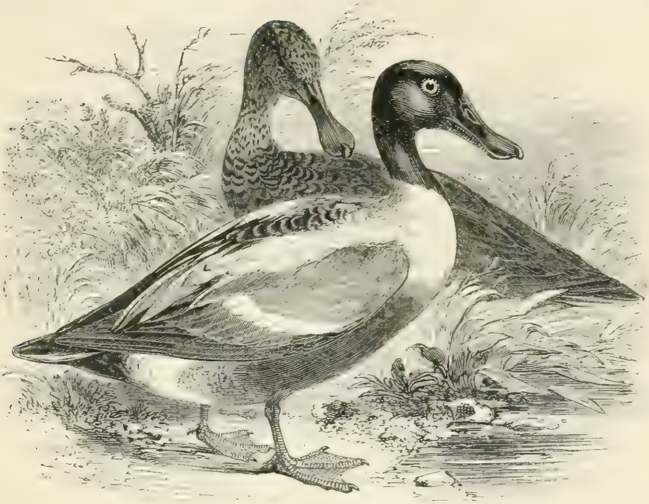
The female has the head and upper part of the neck spotted with dark brown, on a surface of pale brown; the alternate crescentic bands on the lower part of the neck in front dark brown, and pale brown, but the bands broader than in the male; under surface of the body white; lower part of the neck behind, and the upper surface of the body, brown, the feathers edged with paler brown; wing-coverts brown, with paler margins; speculum like that of the male; tail-feathers of dark brown, with edges and tips of pale buffy-brown and white.

The young birds of the year, compared with the adults, are of a more uniform reddish-brown colour above, speckled with dark brown; the middle of each feather also dark brown.

The nestlings of the Mallard and of the Gadwall are much alike—yellowish-white below and umber-brown above; —but there is a more pronounced golden tinge on the throat and cheeks of the Gadwall, the streak through the eye is more defined, and there is a small dark spot at the junction of the mandibles, which the Mallard has not. The above remarks are based on specimens lent by Mr. E. Bidwell.

The windpipe of the Gadwall is rather small in calibre, with a slight enlargement of the tube about two inches above the bony protuberance as here shown. The note of this species is shrill and frequently repeated: hence the name of *strepera.*





Spatula clypeata (Linnæus*).

THE SHOVELLER,

SPOON-BILL DUCK, OR BROAD-BILL.

Anas clypeata.

Spatula, *Boie* †.—Bill much longer than the head, compressed at the base, widening towards the end; lamellæ projecting conspicuously from the base to near the broadest part. Wing pointed, the first and second quill-feathers the longest. Tail short, graduated, of fourteen pointed feathers. Legs very short; hind toe small, free, unlobed.

The Shoveller is to be considered generally as a winter visitor to this country, but some remain to breed; although at the present day few, if any, do so in our southern and western counties, where localities suited to their habits, combined with due protection, are scarce. On the eastern

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[*] *Anas clypeata*, Linnæus, Syst. Nat. Ed. 12, i. p. 200 (1766).

[†] 'Isis,' 1822, p. 564. The present is the only species found in the northern hemisphere, but there are four others, peculiar, respectively, to South America, Australia, New Zealand, and South Africa.

side of England the Shoveller appears to be resident; and in a foot-note to the last edition of Lubbock's 'Fauna of Norfolk,' Mr. Southwell says that although perhaps not so generally distributed as formerly, it still breeds regularly in various parts of the county. Mr. Cordeaux informs the Editor that he knows of three localities in North Lincolnshire, in one of which it is in some numbers; and it breeds sparingly in Yorkshire, Durham, and Northumberland. On the west side of England it is rarer, and there do not appear to be any recent notices of its nesting; but in the Midlands, on a recent visit to Mr. J. Whitaker, the Editor had the pleasure of observing this species, evidently breeding, near Rainworth in Nottinghamshire.

In Scotland the Shoveller has been found nesting in Dumbartonshire, Kirkcudbrightshire, East Lothian, and some other southern counties; also in Elgin; and there is even strong evidence that it breeds as far north as Sutherlandshire; otherwise its appearances are mostly confined to the winter months, and the periods of migration. It is not known to have occurred in the Shetlands; only once in Orkney; and not as yet in the Outer Hebrides. In Ireland, according to Sir R. Payne-Gallwey, the Shoveller is not uncommon in the south, although rare in the north and west. It breeds regularly at Abbeyleix in Queen's County, and on Lough Derg, Shannon; and Major E. A. Butler informs the Editor that he found it nesting in the vicinity of Lough Neagh.

In Scandinavia and in Northern Russia the Shoveller only breeds sparsely, but in Denmark and south of the Baltic it is by no means uncommon in suitable localities in summer, down to the African side of the basin of the Mediterranean, where great numbers of migrants from the north occur in winter. It is very abundant in Egypt and Nubia; and Von Heuglin states that it is resident in Abyssinia. In Siberia in Asia Mr. Seebohm shot a male, and found a supposed nest on the 18th of June, on the Koorayika, close to the Arctic Circle; and southwards the species appears to be found across the entire breadth of the continent, visiting

Japan, South China, and India in winter. Gould states that he had examined a single example obtained in Australia. In America this widely-distributed species is found throughout the continent; breeding from Texas to Alaska, and wintering as far south as Guatemala, Colombia, Cuba, and Jamaica.

The nest of the Shoveller is placed in a tuft of grass, where the ground is quite dry, and is made of fine grass. After the female begins to sit, she covers her eggs with down plucked from her body. In some places this Duck selects, by preference, small islands. The eggs, from eight to fourteen in number, are of a greenish-buff colour, and average 2 in. by 1·4 in. Mr. J. Youell, of Yarmouth, in a communication to the Linnean Society, says, that he, in one season, obtained upwards of thirty eggs of the Shoveller Duck. These eggs were put under some domestic fowls, and most of them were hatched; but he succeeded in rearing only two of them. Their bills, when a few days old, were not longer than those of the domestic Duck, but at the age of three weeks they had obviously increased in length more than those of the common duckling. One of these birds, a male, lived till it was ten months old, and then had attained in a considerable degree the adult plumage of the Shoveller.

That the bill of the young Shoveller when hatched is not dilated laterally, as has been described, the Author can answer. During the summer of 1841, a pair of Shovellers made a nest, and brought out their young on one of the islands in the Gardens of the Zoological Society; the bills of these Ducklings were as narrow, and the sides as parallel, as the bills of some young Gadwalls which were hatched at the same time on an island in the same piece of water.

The Shoveller has bred with the Garganey, and a young male bearing many indications of both parents, was presented to the Zoological Society by the late Lord Saye and Sele. This interesting bird was kept during one summer in a small pond with a female Garganey, and a female

Shoveller, but without success, and the bird died in the following winter.

It inhabits marshes, lakes, rivers, and muddy shores, selecting its food in shallow water, by the instrumentality of the sensitive beak, the laminated sides of which being abundantly supplied with nerves, enable it to retain the nutritious and reject the useless. It feeds on some grasses and other vegetables, with worms, aquatic and other insects, even some that are winged; whence Gesner's name *Anas muscaria.* Vieillot says that one of its common names in France is *Canard gobe-mouche;* it is also called *Rouget de rivière.* Shrimps have been found in its stomach; and Audubon states that in North America it feeds upon leeches, small fishes, ground-worms, and snails. The flesh is tender, juicy, and of good flavour. The excellence of the Canvas-back Duck of America, as an article of food, is proverbial, yet Audubon also says that no sportsman who is a judge will ever go by a Shoveller to shoot a Canvas-back.

In the adult male the beak is lead-colour, dilated on each side towards the tip; the irides yellow; the whole of the head and the upper part of the neck green; lower part of the neck, the interscapulars, scapulars, and some of the tertials, white; middle of the back dark brown, the feathers having lighter-coloured margins; the point of the wing, the lesser wing-coverts, and outer web of some of the tertials, pale blue; greater wing-coverts white; primaries dark brown, almost black; the secondaries the same, but the speculum green; rump, upper tail-coverts, and tail-feathers, almost black; breast, and all the belly rich chestnut-brown; thighs freckled with dark brown, on a ground of lighter pale brown; the vent white; under tail-coverts black; legs, toes, and their membranes, reddish-orange; the nails black.

The whole length is about twenty inches. From the carpal joint to the end of the wing, ten inches; the second quill-feather the longest.

Adult males in summer change the green colour of the head and neck to brown, spotted with very dark brown;

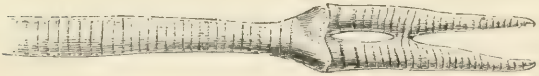
back and scapulars dusky; breast and belly ferruginous, spotted with black; legs orange.

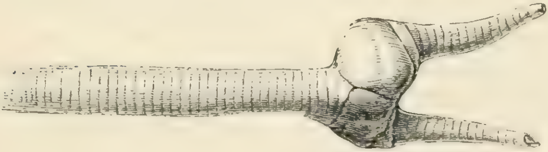
Females have the head and neck mottled with two shades of brown; the feathers on the upper surface of the body darker brown in the centre, with light brown edges and tips; under surface of the body pale brown.

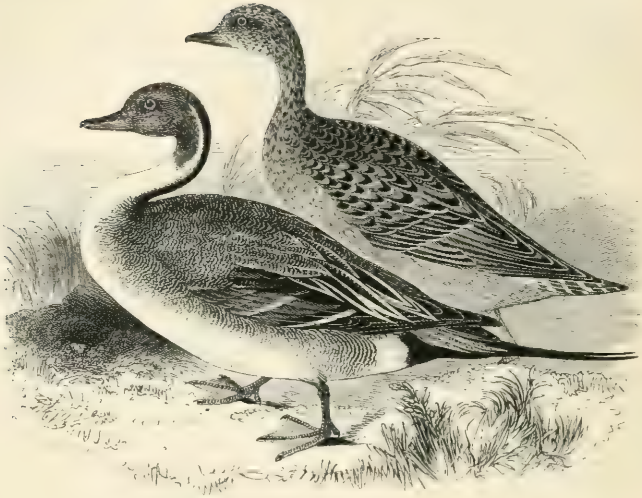
Young males at first resemble females, changing by slow degrees to the true distinctive plumage of the sex, but do not attain it till after the old males have completed their change under the influence of the autumn moult.

A nestling lent to the Editor by Mr. Bidwell, taken at Loch Spynie, Elgin, by the late Charles St. John, and mounted by Mr. John Hancock, is characterized by having a proportionately longer, narrower, and more slender bill than the Mallard, but as yet no widening at the tip is noticeable. The brown of the upper parts is nearly uniform and unspotted.

Of the windpipes figured below, that with the circular bony enlargement belongs to the male Shoveller, the other to the female.







DAFILA ACUTA (Linnæus*).

THE PINTAIL DUCK.

Anas acuta.

DAFILA, *Stephens*†.—Bill about as long as the head; the edges nearly parallel, but widening a trifle to the end; lamellæ not very strongly defined. Neck long and slender. Wings long and pointed, the first and second quill-feathers subequal and longest, the rest rapidly graduated. Tail sharply pointed; the central rectrices considerably elongated in the male. Legs rather short; hind toe small; margin of web to anterior toes, slightly emarginate.

THIS slender and handsome Duck is a regular visitor to this country, and is one of the first among those species which are taken when the decoys begin to be worked in October. It remains here through the winter till spring, and is obtained by wild-fowl shooters on the coast, as well as by fenmen on the rivers and lakes of the interior. It does not appear to linger long in the northern portions of our islands, and cannot in fact be called abundant there; but along our southern shores and estuaries it is not uncommon. Rodd states that in the winter of 1853, thirty-seven Pintails were bagged at one shot with both barrels of a heavy shoulder-gun, out of an unusually large flock at Helford in Cornwall; and the species is a regular visitant on the coast of Dorsetshire and Hampshire, particularly from Poole Harbour to Lymington, where, as in many other places, it is called the Sea Pheasant, on account of the length of its tail, and where it is seen in small flocks during winter. It occurs also irregularly in the marine and fenny districts of the eastern counties; but Mr. J. H. Gurney, jun., says that at the present day it is scarce in Norfolk, even in winter, although the allusions made by Hunt to specimens in Norwich market in June and July, seem to indicate breeding in former times. The figure of the male on the foreground in the illustration of the species here given, was taken from a fine specimen killed in Cambridgeshire, in the collection of the late Dr. Thackeray, Provost of King's College. In Northumberland it is decidedly rare, but Mr. John Hancock thinks that before the drainage of Prestwick Car, some used to nest there. In Wales, and on the western side of England, it appears to be uncommon.

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* *Anas acuta*, Linnæus, Syst. Nat. Ed. 12, i. p. 202 (1766).

† Shaw's Gen. Zool. xii. pt. ii. p. 127 (1824). *Dafila* appears to be merely a name of pleasant sound: signifying nothing.

In Scotland, according to Mr. R. Gray, it has occurred in almost every county, especially on the east coast; although nowhere an abundant species. It has even been supposed by Mr. Harvie-Brown to have nested on the island of Hysgeir, and in Sutherlandshire, but as yet the evidence, founded on the down in the nests, is not conclusive;* and only two occurrences in the Outer Hebrides are recorded by Mr. R. Gray. Orkney and Shetland appear to be visited by this Duck, but Saxby says that to the latter it seldom comes except after stormy weather in spring; and he adds significantly, and probably with reference to its reported abundance in Orkney, that the bird generally known as the 'Pintail' is the Long-tailed Duck.

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* Pr. R. Phys. Soc. Edinb. vii. pp. 173, 174, 176.

The Pintail is stated by Sir R. Payne-Gallwey to be rather local in Ireland, and rarely to be met with on the great loughs of the north; but south of Athlone, and especially on the estuaries of Clare, Connaught and Kerry, they are numerous. He says that he has seen female Pintails with young broods in June, on Loughs Mask and Corrib, and in summer on Lough Inagh, Connemara; and he asserts, apparently on the authority of the Hon. B. Fitzpatrick, that one or two pairs breed every year at Abbeyleix, Queen's County, in Lord Castletown's famous duck-preserves. Confirmation of this would be interesting.

The Pintail has been known to breed in the Færoes; it appears to be of general distribution in Iceland during the summer months; and in Greenland it is of accidental occurrence. Its breeding-range extends over Scandinavia, Denmark, Northern and Central Germany, Poland, and a great part of Russia; the species being generally distributed over the rest of Europe on migration. Mr. Abel Chapman observed about a dozen adult males at Santa Olaya, Andalucia, so late as the 8th of May. In winter it is found throughout the Mediterranean; Northern Africa; Egypt; Asia Minor; India as far south as Ceylon and Burmah; Borneo; China; and Japan; its summer range stretching over Central and Northern Asia, up to, and even beyond, the Arctic Circle. The Pintail is also generally distributed throughout North America, from Alaska to Labrador in summer; its migrations extending over the greater part of the United States, and down to Mexico, the Antilles, Costa Rica, and Panama.

The nest of the Pintail is made in rushes and strong herbage; the eggs, usually seven or eight in number, are greenish-white in colour, rather elongated in form, and average in measurements 2·1 by 1·4 in. The flight of this species is extremely rapid, but no particular order or figure is observed among the 'skeins.' Flocks consisting entirely of males are not uncommon. It is observed to feed by preference in shallow water, and it selects plants, especially *Equisetum*, insects and their larvæ, and mollusca. Jardine mentions having once shot two while they were feeding in the evening on a wet stubble field, in company with the common Wild Duck. This species is one of the best of our various Ducks for the table; the flesh is excellent, and in great esteem.

The Pintail is rather a silent bird by day, but at night, or when disturbed, it utters a soft quack, low in tone, but audible at a considerable distance. Montagu says "that the notes of the Pintail are extremely soft and inward; the courting note is always attended with a jerk of the head; the other greatly resembles that of a very young kitten. In the spring the male Pintail indicates his feelings by suddenly raising his body upright in the water, and bringing his bill close to his breast, uttering at the same time a soft note. This gesticulation is frequently followed by a singular jerk of the hinder part of the body, which in turn is thrown up above the water."

Lord Stanley informed Montagu that he had a hybrid brood produced two seasons following between a female Pintail and a male Wigeon; the hybrid birds laid eggs during two successive seasons, but they were unproductive. In December, 1831, the Hon. Twiselton Fiennes exhibited at the Zoological Society a specimen of a hybrid Duck, bred between a male Pintail and a Common Duck. It was one of a brood of six, several of which were subsequently confined with the male Pintail from which they sprung, and produced young. A specimen of a female of this second brood was also exhibited, and the three part-bred Pintails having bred again with the true Pintail, the offspring lost all the appearance of the Common Duck. Hybrids between the Mallard and the Pintail are not uncommon, and the plumage of the male is very beautiful. In former Editions it was stated that Pintails did not breed readily in confinement, and that neither the Zoological Society nor the Ornithological Society had succeeded with them, although both Societies had several pairs on waters and islands apparently well adapted to their habits; but Mr. P. L. Sclater asserts that the Pintail does well in captivity, breeding freely in the Zoological Gardens;

and in proof of this he gives the dates of the hatching of broods in fourteen years from 1839 to 1861 inclusive (P. Z. S. 1880, p. 515).

The male Pintails undergo that remarkable summer change in their plumage which renders them for a time like their females in appearance. This alteration commences in July: partly effected by some new feathers, and partly by a change in the colour of many of the old feathers. At first one or more brown spots appear in the white surface on the front of the neck; these spots increase in number rapidly, till the whole head, neck, breast, and under surface have become brown; the scapulars, wing-coverts, and tertials, undergo, by degrees, the same change from grey to brown. The Author has seen a single white spot remaining on the breast as late as the 4th of August; but generally by that time the males can only be distinguished from females of the same species by their larger size, duller colour, and pale blue beak, whereas in the female the bill is dark brown. The Author has seen a male Pintail, confined in the hutch of a dealer throughout the summer, that did not exhibit any change at all. The following is Montagu's description of a male Pintail after he had thrown off the male plumage, taken on the 19th of August:—"Bill as usual; top of the head, and from thence down the back of the neck, dusky and pale ferruginous, intermixed in minute streaks, paler on the forehead; sides of the head and throat brown, with minute dusky specks tinged with ferruginous; the front and sides of the neck brown, with dusky-black spots, which are minute on the upper part, becoming larger by degrees downwards, where they are also more distinct; the breast and belly very pale brown, with more distant dusky spots; the back and scapulars dusky-black, with pale margins, each feather having a transverse bar of white near the tip; the longer scapulars are only margined with rufous-white, and some are powdered with white; the rump, like the back, but these feathers gradually lose the white bar as they approach the tail, so that the tail-coverts are only margined with white; the feathers on the sides of the body being large, have broad margins, with the middle dusky-black, in which is either a ferruginous-white bar, or two spots, one on each side of the shaft; the prime quills dusky-grey as usual; the speculum changeable green, or copper, tipped with white, a violet bar dividing the green from the white: the first tertial is brown on the inner web, grey on the outer near the shaft, and a broad margin of violet; the rest of the tertials are brown, dashed with cinereous-black near the shafts; the coverts of the wings plain dark cinereous, the largest series tipped with bay; the tail consists of sixteen dusky feathers, dashed with cinereous, gradually becoming darker towards the middle feathers, which rather exceed the next in length, making the tail regularly cuneiform: vent and under tail-coverts rufous-white, with distant black spots."

At the annual autumn moult the males again assume with their new feathers the colours peculiar to their sex, but the assumption is gradual. White spots first appear among the brown feathers on the front of the neck; by the end of the second week in October the front of the neck and breast is mottled with brown and white; at the end of the third week in October a few brown spots only remain on the white.

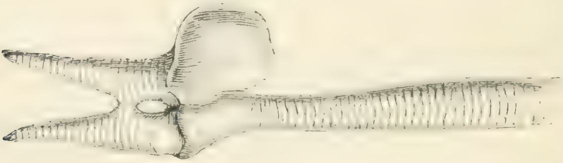
The appearance of the adult male in July, August, and September, has been already noticed. In winter the bill is lead-grey on the sides, part of the central ridge and the base brownish-black; irides dark brown; head, cheeks, chin, sides, and upper half of the neck in front rich dark brown; nape and back of the neck the same, the occipital portion tinged with purple; back, scapulars, the part before the wings, and the smaller coverts, rich grey, produced by fine undulating alternate lines of greyish-white and bluish-black; primaries greyish-brown: secondaries black, the end of the outer web of each forming a speculum of dark green: greater wing-coverts ash-brown, tipped with reddish-buff and white; tertials elongated, black in the centre, with a white lateral margin on the outer web, and a grey one on the inner; tail-coverts ash-grey; the elongated tail-feathers black; the others dark brown, margined with white; from the occipital portion of the neck on each side descends a white stripe, which becoming broader as it passes downwards, extends in front over the whole of the lower portion of the neck, breast, belly, and part of the flanks; the sides grey; vent and under tail-coverts velvet-black; legs, toes, and their membranes, blackish-brown.

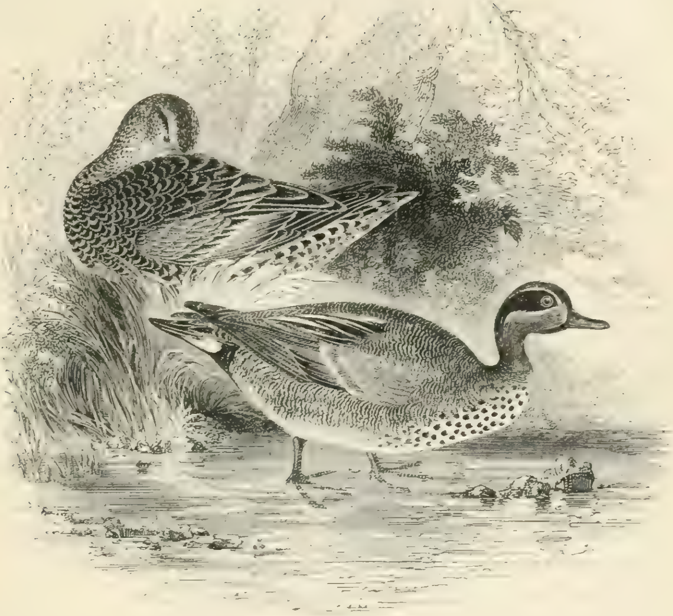
The whole length of the male, somewhat influenced by the tail-feathers, is from twenty-six to twenty-eight inches. From the carpal joint to the end of the wing ten inches and a half. The weight varies from 1lb. 10oz., to 2lb. 12oz.

The female has the head reddish-brown; the neck pale brown, both parts speckled with very dark brown; upper surface of the body dark brown; each feather almost black in the centre, and pale brown on the margin; tail-feathers also dark brown, varied with pale brown; no appearance of white lines on the sides of the neck; under surface of the body nearly uniform pale brown.

A downy nestling from Lapland, in the collection of Mr. E. Bidwell, is characterized by the greyish-white of the streak over the eye, and the under parts; there being a complete absence of the yellowish tint observable in many other nestling Ducks.

The length of the windpipe in this species is about nine inches and a half, the diameter of the tube slightly enlarged about an inch above the bony labyrinth, the form of which is figured below.





QUERQUEDULA CRECCA (Linnæus*).

THE TEAL.

Anas crecca.

QUERQUEDULA, *Stephens*†.—Bill about as long as the head, the edges nearly parallel; the extremities of the lamellæ exposed along the projecting edge of the upper mandible; nostrils small and oblong. Wings rather long, pointed, the first and second quill-feathers sub-equal and longer than the rest; scapulars and inner secondaries elongated and pointed. Tail of sixteen feathers, short and rounded. Legs short; tarsus compressed, anteriorly scutellate; hind toe very small; outer toe much shorter than the third; centre toe rather long; interdigital membrane emarginate; claws small, somewhat curved.

THIS prettily marked species, the smallest of our Ducks, but one of the best as an article of food, is principally known as an early and constant winter visitor, making its appearance in September, and remaining with us till spring has made considerable progress. Its numbers are recruited through the winter months by additional arrivals from the northern parts of Europe, and our markets in consequence obtain a regular supply from the various decoys and other modes of capture. Although the majority return in spring to more northern localities to breed, many remain in this country, and pass the summer near fresh-water lakes. In the south of England suitable localities are comparatively scarce, but it nests, although sparsely, in Devon, Dorset, Hampshire, Sussex, Kent, and, occasionally, along the valley of the Thames. In the eastern counties, especially Norfolk, it is a fairly numerous breeder; north of the Trent, it is to be found nesting still more frequently; the Welsh lakes and bogs offer it suitable summer retreats, and so do the 'mosses' of Lancashire and Cumberland. In Scotland it breeds regularly in most districts, although only sparingly in Orkney and Shetland. In Ireland it is common, and to a considerable extent resident; its numbers receiving important accessions in autumn and winter.

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* *Anas Crecca*, Linnæus, Syst. Nat. Ed. 12, i. p. 204 (1766).

† Shaw's Gen. Zool. xii. pt. ii. p. 142 (1824).

In summer the Teal is abundant in Iceland, Scandinavia, and the north of Europe; it visits the Canaries, and Madeira; breeds in the Azores; and there is fair evidence that some remain to nest in Spain, Greece, and other portions of the south of Europe. In winter it is found all over the Continent, wherever fresh water does not freeze for any time; it visits North Africa; is very numerous in Egypt; and goes as far south as the highlands of Abyssinia. Eastward, it is found in Asia Minor, Palestine, Persia, India down to Burmah, and Siam, on passage; also in China and Japan; its breeding-range extending across the central and northern portions of Asia up to the Arctic Circle.

Our Teal is a rare straggler to Greenland, Labrador, and the eastern seaboard of America, down to North Carolina. Its representative, however, on that continent is the American Green-winged Teal, *Q. carolinensis*, the male of which differs from the Old World bird in not having a well-defined buffish-white margin round the green patch on each side of the occiput; and only a very faint streak from the base of the bill towards the eye; it has, on the other hand, a white, crescentic bar in front of the wing, and the mottlings of the plumage are more delicate.*

The nest of the Teal, placed in rushy herbage, or in morasses and bogs, is formed of decayed vegetable matter, and during the progress of incubation is gradually lined with down and a few feathers. The eggs, varying from ten to fifteen in number, are usually of a pale buffish-white, but a tinge of green is sometimes met with; average measurements 1·8 by 1·2 in. Various instances are on record of the gentle and confiding habits of this bird with regard to its brood; and the following was described to Sir R. Payne-Gallwey, in August 1881, by Mr. Salt, Lord Cavan's agent, who witnessed the occurrence:—"Last week a farm-boy near here fell in with a brood of young Teal. He drove them before him to Lord Cavan's Lodge. The mother Teal would not forsake her young, but followed after, keeping close at hand all the time. The boy drove them into the yard and into a little shed. The old bird, following all the time, ran in after them, and though there were dogs and people about, she was not the least afraid." The food of the Teal consists of seeds, grasses, water plants, and insects in their various states. In confinement they require grain. They have been in the Gardens of the Zoological Society since 1830, and have repeatedly bred there.

Mr. John Hancock states (N. H. Tr. Northumb. vi. p. 153) that he has carefully examined the British specimen of the so-called Bimaculated Duck, figured in the 1st and 2nd Editions of this work, but not in the 3rd, and he is convinced that it is a hybrid between the Teal and the

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* Mr. H. Nicholls states ('The Field,' lv. p. 8), that a "full-dressed male" example of the American Green-winged Teal was purchased by his brother on the 23rd November, 1879, from a gunner, who said that he had just shot it on the Kingsbridge estuary, Devon. Thereupon Mr. Arthur Fellowes writes (*tom. cit.* p. 79), that he has one shot by his father more than forty years ago, at Hurstbourne Park, Hants. It would be desirable that these specimens should be publicly exhibited before some competent body of ornithologists.

Wigeon. Mr. Bond has a fine example in the male plumage resulting from this unusual cross.

In the adult male Teal the beak is nearly black; the irides hazel; forehead, and a narrow band over the top of the head, rich chestnut-brown; at the gape and upwards, along the base of the upper mandible, and from thence high up over the eye, and then backwards towards the occiput, there is a narrow line of buff; from the lower edge of the eye to a point below and behind the ear-coverts, another narrow line of the same light colour; all the space from the eye between these two lines, and extending backward to the occiput, forms a broad patch of rich glossy green; cheeks and sides of the neck, below the under light-coloured line, rich chestnut; back of the neck, scapulars, and upper part of the back a mixture of black and white in narrow transverse lines; the longest of the scapulars and the tertials dark brown; all the smaller wing-coverts ash-brown; the large coverts tipped with white, forming a bar, two or three of the higher coverts having their white tinged with bay; primaries dark brown; the secondaries forming a speculum of velvet-black, green and purple, tipped with white; lower part of the back dark brown; upper tail-coverts almost black, edged with rufous; tail-feathers pointed, dark brown; the chin black; front of the upper part of the neck chestnut; lower part of the neck in front partly covered with circular spots of black, on a ground of white, tinged with pale purple; breast and belly white; sides and flanks barred with narrow black and white lines; central under tail-coverts velvet-black; lateral tail-coverts delicate buff-colour, with a narrow band of velvet-black at the base; under surface of tail-feathers ash-grey; legs, toes, and membranes, brownish-grey.

The whole length is fourteen inches and a half. From the carpal joint to the end of the wing seven inches and a quarter.

Of male Teal observed constantly in the summer of 1844, some had lost the sexual distinctions of the plumage by the 27th of July, and all were changed by the 4th of August;

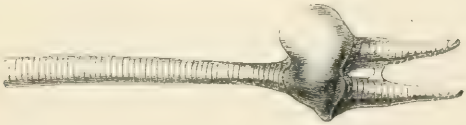
remaining like the females, till they acquired new feathers at the autumn moult.

The female has the whole of the head speckled with dark brown, on a ground-colour of light brown; upper part of back and scapulars dark brown, each feather with two narrow transverse bars of buffy-brown; wing like the male, but the speculum has more velvet-black, less green, and no purple colour; chin pale brown; lower part of neck on the front and sides varied with two shades of brown, in crescentic marks; breast white; sides, flanks, belly, and under tail-coverts, dull white, spotted with dark brown.

Varieties of the Teal are occasionally met with; one in the collection of Mr. J. Whitaker, has the wings and back of a light slate-colour, and the breast several shades lighter than usual.

The nestling is yellowish-white on the under parts; buff on the forehead and throat; a dark brown streak from the forehead to the crown, which, with the upper parts, is brown; a dark loral streak, and two other streaks from behind the eye to the nape, on each side.

The trachea of the male Teal is about five inches in length, the tube rather narrower near the middle than at any other part; the bony enlargement of the size and form represented in the figure below.



A male example of the 'American Teal' is stated by Mr. John Evans, without any description, to have been shot near Scarborough in November 1851 (Zool. p. 3472); but Mr. W. E. Clarke takes no notice of it in his 'Handbook of Yorkshire Vertebrates.' In 'The Naturalist,' viii. (1858), p. 168, Mr. W. G. Gibson, writing from Dumfries, says, without naming any month, "a specimen of the Blue-winged Teal (*Anas discors*) was shot near here a few weeks ago." Mr. R. Gray makes no allusion to this record in his 'Birds of the West of Scotland,' but he states (p. 373) that a specimen of this North American Teal was shot by the late Mr. Shaw of Drumlanrig, in January 1863, on the Nith, Dumfriesshire, and afterwards passed into the collection of the late Sir William Jardine, who briefly mentioned the circumstance to Mr. Gray, in a letter dated the 15th March, 1867, but does not appear to have published any account or description of this acquisition.* In 'The Zoologist' for 1882, p. 92, Mr. T. H. Nelson mentions, amongst other birds shot near Redcar, on the 3rd September, 1881, "a Blue-winged Teal, *Q. discors*." This specimen he kindly forwarded for the inspection of the Editor, who has no hesitation in pronouncing it to be an immature example of *our* Blue-winged Teal, *i.e.*, the Garganey; but certainly not *Q. discors*. Where specimens of the American bird are available for comparison with the Old World species, the vivid lapis-lazuli blue of the wing-coverts in the former will always serve to distinguish immature birds, and there need be no doubt respecting adults. If the identification can be trusted, an example of the American species was obtained, according to Degland and Gerbe, on the authority of M. Canivet, 'many years ago,' by a M. Valier, in the market of Carentan, Département de la Manche!

The North American Summer Duck, *Aix sponsa*, frequently kept and a free breeder on ornamental waters, sometimes escapes, and is duly shot and recorded. Two killed in co. Waterford had B B stamped on their webs.

The Musky Duck, *Cairina moschata*—better known by the absurdly perverted name of 'Muscovy' Duck—a native of tropical America, has for three centuries been domesticated in Europe. It breeds freely with the Common Duck and other species; and both pure and hybrid birds wander and get shot.

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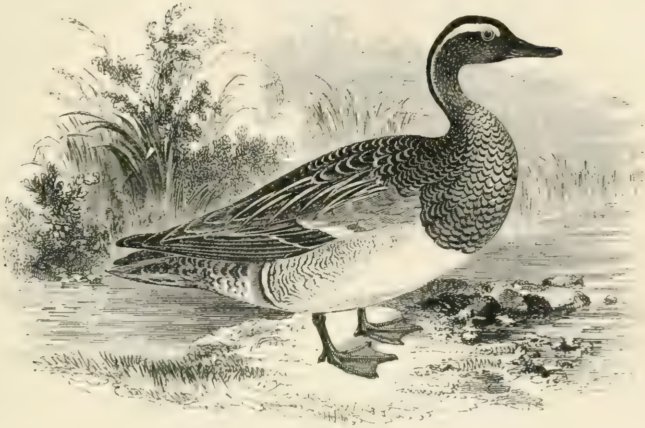
* From information received from Mr. R. Service, the Editor has no doubt that the year was 1858.



QUERQUEDULA CIRCIA (Linnæus*).

THE GARGANEY,

OR SUMMER TEAL.

Anas querquedula.

INTERMEDIATE in size between the Teal and the Wigeon (the bird next in succession to be described), the Garganey is a rather rare or local species which visits the British Islands on the spring migration; remains to breed in suitable spots, if unmolested; and is again observed on its southward migration in autumn. In Norfolk, where, owing to protection, it appears to be on the increase, it nests regularly in the 'broad' district in some numbers, and, sparingly, in some other localities; its nest has also been found near Leiston, in Suffolk (Zool. s.s. p. 4036). It visits Lincolnshire in April; and Mr. Hancock thinks that before the drainage of Prestwick Car, it bred in Northumberland. Elsewhere it is an occasional visitor in spring, summer, and autumn; becoming rarer on the western side. As regards Scotland, Dr. Edward Clarke sent the Author notice from Edinburgh that six specimens were shot in Stirlingshire during the last fortnight of March 1841; one was shot there in May 1857; a few have been obtained on the eastern side; a very few have been recorded from the south-west; it has been obtained as a rare spring visitant in the Orkneys; and, as an uncommon straggler, in Shetland. In Ireland, according to Sir R. Payne-Gallwey, it is the rarest of the tolerably well-known Ducks, and he can give but very few authenticated instances of its occurrence.

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* *Anas Circia*, Linnæus, Syst. Nat. Ed. 12, i p. 204 (1766).

The Garganey is a summer visitant to Scandinavia, nesting in considerable numbers in Denmark; it is also common at that season in Russia as far north as Archangel. It appears to be generally distributed during the breeding-season throughout Europe down to the Black Sea and the Mediterranean; but in the western portion of the Spanish Peninsula it is very rare, although it is found on the east side, where there are lakes with large reed-beds suited to its habits. From autumn to spring it is not uncommon in Northern Africa, Egypt, and portions of Arabia. Its breeding-range can be traced across the temperate zone of Asia to the Amoor, in summer; in the cold season it visits China, the Philippines, Java, Borneo, and Celebes; it is one of the commonest Ducks in Burmah, and has even been said to breed in Moulmein; it has also been supposed to nest in some parts of India, to which, however, it is principally an abundant winter visitor, and is known as the Blue-winged Teal. The American Blue-winged Teal, *Q. discors*, is, as already stated (p. 392), a perfectly distinct species.

The nest of the Garganey is described by the late Mr. Hoy as placed in low boggy situations, in Holland, and composed of rushes and dry grass, lined with the down of the bird. In the 'broad' district in Norfolk, the densest reed-beds are preferred. Laying commences in the latter half of April; the eggs, usually eight, but sometimes thirteen in number, are of somewhat more creamy-yellow than those of the Common Teal, and measure about 1·9 by 1·3 in.

The food of this species consists of water-plants, rice and grain when procurable, insects and their larvæ, small frogs, worms, &c.; also, when on the sea-coast or tidal waters, small crustaceans and mollusks. For the table this Duck is not, as a rule, a remarkably good bird. Its flight is very rapid; it swims well, and altogether it is a very active species. Its usual note, a harsh *knack*, is loud for the size of the bird; and in the spring the drake makes a peculiar jarring noise, like that of a child's rattle; whence the name of 'Crick' or 'Cricket Teal' in East Anglia, and *Krikand* in Denmark.

The adult male, in March, has the bill black; the irides hazel; the forehead, top of the head, and occiput, dark brown, forming a stripe which ends in a point half way down the neck behind; over the eye and ear-coverts, on each side, and passing to the back of the neck, under the dark brown stripe, is a stripe of white; cheeks, and sides of the neck nutmeg-brown, varied with short hair-like lines of white; the back dark brown, each feather edged with lighter brown; scapulars elongated, black, with a central stripe of white; wing-coverts bluish-grey; speculum dull green margined with white; primaries brownish-black; tertials bluish-grey; tail greyish-brown; chin black; neck in front, and the whole of the breast, dark brown, with pale brown crescentic bands; belly white; sides and flanks varied with transverse black lines bounded by two broad bands; under tail-coverts mottled black and white; legs, toes, and their membranes greyish-brown. Mr. J. H. Gurney, jun., states that the male Garganey remains for an unusually long period in the plumage of the female.

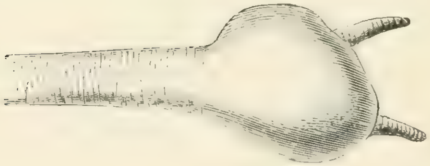
The whole length is sixteen inches. From the carpal joint to the end of the wing seven inches and three-quarters; the first quill-feather the longest.

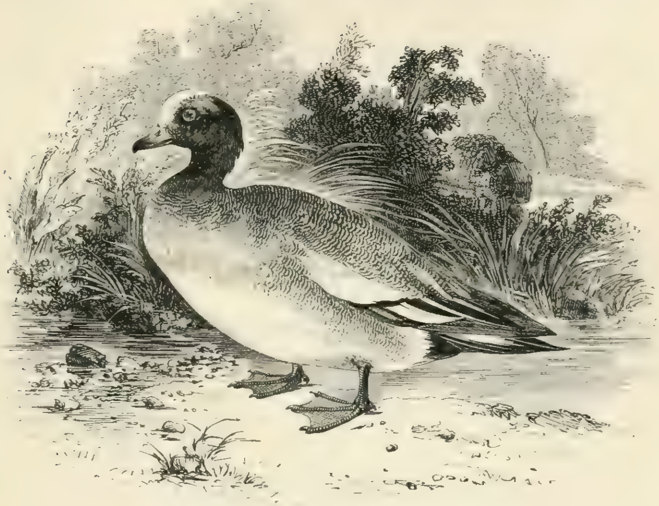
Females are smaller than males, and have the whole of the head brown, with darker spots and lines; over the eye a light yellowish-white band; back, scapulars, and inner secondaries dark brown, with ferruginous edges and white tips; wing-coverts greyish-brown; speculum very dull metallic green, between two bars of white; chin white; breast varied with two shades of brown, on a surface of greyish-white; sides and flanks pale brown, varied with darker brown.

Young males, as usual, resemble females in their first plumage, attaining their sexual distinctions after their first moult. They may be distinguished from the Common Teal by their larger size, bluish-grey wing-coverts, and the green speculum.

The downy nestling is characterized by a very broad unbroken buff streak above the eye, and a well-defined dark streak through the cheek.

The windpipe of the Garganey is about seven inches in length; the form of the bony enlargement nearly oval, and placed so as to appear like a continuation of the tracheal tube; the enlargement is in the front, and the bronchial tubes come off from the flattened inner surface which lies upon the œsophagus.





Mareca penelope (Linnæus*).

THE WIGEON.

Anas penelope.

Mareca, *Stephens*†.—Bill considerably shorter than the head, higher than broad at the base, gradually depressed and narrowed towards the point; culmen slightly concave; lamellæ only just visible; wings rather long and pointed; the first and second quills sub-equal and longer than the rest. Tail short and pointed. Legs short, the tibia bare for a short distance; hind toe with a very narrow lobe; feet rather small.

Immense numbers of Wigeon visit this country during the winter season, frequenting the coast, as well as the rivers, lakes, and fens of the interior. The species is justly in great esteem for the table, although from its abundance, it generally sells at a moderate price. Its habits in some respects resemble those of the Wild Duck, and great quantities are taken with them in decoys; while for coast night-shooting, Hawker says, the Wigeon is like the fox for hunting,—it shows the finest sport of anything in Great

* *Anas Penelope*, Linnæus, Syst. Nat. Ed. 12, i. p. 202 (1766).

† Shaw's Gen. Zool. xii. pt. ii. p. 130 (1824).

Britain. On this point Sir R. Payne-Gallwey's 'Fowler in Ireland' (pp. 36–48) may be consulted.

The Wigeon usually appears about the end of September or the beginning of October, and flocks continue to arrive at intervals till the weather becomes severe. Waterton observes that "the Wigeon is a much more familiar bird than either the Pochard or the Teal. While these congregate on the water, beyond the reach of man, the Wigeon appears to have divested itself of the timidity observable in all other species of wild-fowl, and approaches very near to our habitations. A considerable time elapsed before I was enabled to account satisfactorily for the Wigeon remaining here during the night; a circumstance directly at variance with the habits of its congeners, which, to a bird, pass the night away from the place where they have been staying during the day. But, upon paying a much closer attention to it than I had formerly been accustomed to do, I observed that it differed from them all, both in the nature of its food, and in the time of procuring it. The Mallard, the Pochard, and the Teal, obtain nearly the whole of their nourishment during the night. On the contrary, the Wigeon procures its food in the day time, and that food is grass. He who has an opportunity of watching the Wigeon when it is undisturbed and allowed to follow the bent of its own inclinations, will find that, while the Mallard, the Pochard, and the Teal, are sporting on the water, or reposing on the bank at their ease, it is devouring with avidity that same kind of short grass on which the Goose is known to feed. Hence, though many flocks of Wigeons accompany the other water-fowl in their nocturnal wanderings, still numbers of them pass the whole of the night here; and this I know to be a fact, by their singular whistling noise, which is heard at all hours."

The Editor has been favoured by Mr. Cordeaux with the following interesting statement:—

"From an old decoy book—that of Steeple, in Canney Marsh, Essex—I find that between the years 1714–1726, 44,677 Wigeon were taken in the following monthly proportions:—August, 1,085; Sept., 15,897; Oct., 18,671;

Nov., 7,655; Dec., 1,085; Jan., 275; Feb., 9. This proves that 150 years ago the great takes of Wigeon were made in the early autumn months, not, as at present, in January, February, and March. Some of the best days in the Canney decoy were:—Sept. 20th, 1714: 1 Duck, 20 Teal, 785 Wigeon; Sept. 23rd, 1715: 7 Teal, 1 Pintail, 478 Wigeon; Oct. 7th, 1715: 6 Teal, 4 Pintail, 572 Wigeon; Oct. 14th, 1715: 2 Teal, 1 Duck, 490 Wigeon; Oct. 18th, 1715: 1 Teal, 1 Duck, 1 Pintail, 537 Wigeon; Aug. 23rd, 1716: 3 Teal, 548 Wigeon; Sept. 16th, 1717: 702 Wigeon; and 384 on previous day. The two best months were:—Sept. 1714: 39 Ducks, 81 Teal, 9 Pintail, 3,907 Wigeon; Sept. 1717; 12 Ducks, 8 Teal, 1 Pintail, 3,440 Wigeon. The best year:—1714, 675 Ducks, 347 Teal, 46 Pintail, 6,296 Wigeon. Total of thirteen years: —4,576 Ducks, 1,396 Teal, 138 Pintail, 44,677 Wigeon.—Total: 50,787."*

In March and April Wigeon move northward for the breeding-season, and up to the present time none have been proved to breed in any county of England or Wales; although it is not improbable that a pair or two may have remained for that purpose, from time to time, in Norfolk. In Scotland the Wigeon was found nesting in Sutherlandshire by Jardine and Selby, in 1834, and it is now known that a good many pairs breed throughout the greater part of that county, with the exception of the west. Ross-shire, Caithness, and Cromarty are also counties in which it is known to nest; there is little doubt that it does so in the Outer Hebrides; and its eggs have been taken in Orkney and in Shetland.

In Ireland, according to Sir R. Payne-Gallwey, the Wigeon is abundant in suitable spots throughout every county; but he says that he has never succeeded in finding a nest, although he has searched at least fifty lakes to that end; and he has seen young birds and females together on Lough Derg (Shannon), Lough Ree, Lough Corrib, Lough Mask, and Lough Conn, when fishing in the early autumn.

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* For further details, see 'The Field,' li. p. 419, and liv. p. 38.

On the authority of the Rev. G. Robinson, and of Lord Caledon, he states that the Wigeon nests at Caledon, co. Tyrone; also at Castle Dillon, co. Armagh, and at Portmore Lough.

The Wigeon is a summer visitor to the Færoes and Iceland; and has been known to straggle to Greenland. It breeds in great numbers in Scandinavia, Finland, and Northern Russia: in the latter as far south as Ekaterinburg; a few may, perhaps, nest in Denmark, Holland, and Northern Germany; and in autumn, winter, and spring this bird is generally distributed over Europe and the basin of the Mediterranean, its migrations extending to Abyssinia. Eastward it is found right across Asia, breeding from the Arctic Circle southwards to Mongolia; ranging in winter to Japan, China, Borneo, many parts of India, and the Persian Gulf. Dr. O. Finsch obtained a specimen at Jaluit, one of the Marshall Islands, Polynesia, on the 26th of October, 1883. From Siberia we trace it across Bering Sea to the Prybilov Islands, the Aleutian Islands (where it is said to breed) and Alaska; and Dr. Cooper states that it is not unfrequently to be seen in the Californian markets. On the eastern side of America it has been obtained on a good many occasions, and it appears to visit the coasts of Virginia and the Carolinas almost every winter.

The nest, placed in a clump of rushes or in a tuft of heather, is warmly lined with the down of the parent bird, and contains from seven to ten oval creamy-white eggs; average measurements 2·3 by 1·5 in. The note of the Wigeon is a shrill whistle, and in some parts of England it is in consequence called the Whew Duck and Whewer; its name in France, *Canard siffleur*, has reference to the same circumstance. In some books on cookery and in bills of fare, especially in Norfolk, Wigeon are called 'Easterlings'; and all over Lapland they are called by a name signifying 'Grass Ducks.' Although not in the habit of diving for food, the Wigeon can dive very well when wounded and pursued, turning rapidly under water.

Wigeon do not breed very freely in confinement, and

Mr. P. L. Sclater only cites three instances of broods having been batched in the Zoological Gardens. Mr. Cecil Smith has been rather more successful, his birds having bred regularly since 1872 (Zool. 1881, p. 448).

The male Wigeon has bred with a female Pintail, and in other instances with the Common Duck. A preserved specimen given to the Author by the late Richard Dann, had all the appearance of being a hybrid between the Wigeon and Common Duck; and the cross between the Wigeon and the Teal has already been noticed (p. 389).

In the adult male the bill is bluish lead-colour tipped with black; irides dark brown; from the eye a green streak passing backwards; forehead and top of the head creamy-white; the cheeks and hind part of the neck rich chestnut minutely spotted with bottle-green; interscapulars, scapulars, and all the back, greyish-white crossed with irregular zigzag lines of black; upper tail-coverts freckled with grey; tail-feathers elongated, pointed, and nearly black; wing-coverts white, tipped with black; the primaries uniform dark brown; the outer webs of the secondaries form a green speculum edged with black; the black outer webs of the inner secondaries broadly edged with white; the inner webs hair-brown; chin and neck in front chestnut, turning to black in mature birds; lower part of the neck and the space before the wing pale rufous; under wing, sides, and flanks marked with dark transverse zigzag lines on a ground of white; breast, belly, and vent white; under tail-coverts velvet-black; legs, toes, and their membranes dark brown.

The whole length is eighteen inches. From the carpal joint or point of the wing to the end of the longest quill-feather, ten inches and a half; the length of the first and second primary quill-feathers nearly equal.

The adult male birds undergo considerable change in their appearance towards the end of June or the beginning of July; at which time, says Mr. Cecil Smith, the head, neck, breast and flanks, become a rich rusty-red, but always so much brighter than the browner tints of the female, that the sexes may easily be distinguished. By the end of September the ordinary male plumage begins to reappear; the first sign being the white patch on the head.

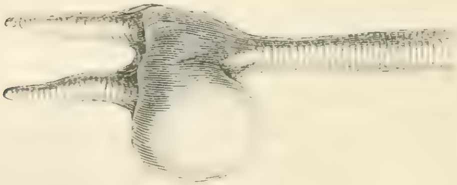
The female Wigeon has the bill bluish-black; the irides brown; head and neck brown tinged with rufous, and speckled with dark brown; the back varied with two shades of brown, that in the centre of each feather the darkest in colour, the paler brown on the margins tinged with rufous; quill and tail-feathers as in the male; under surface of the body nearly white.

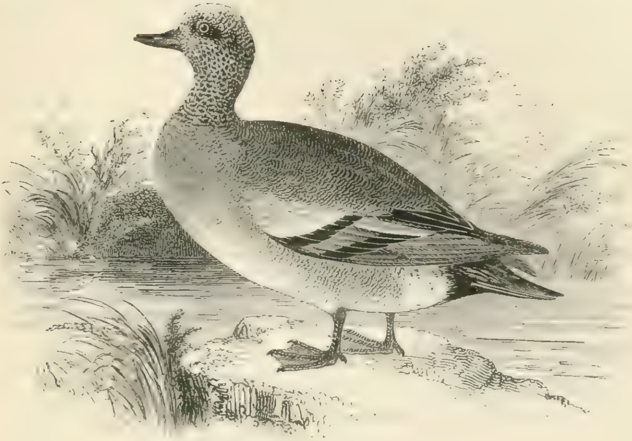
Under date of 10th February, 1885, Mr. Cecil Smith writes to the Editor:—"My old hen Wigeon is now in nearly full male plumage, except that the white patch on the forehead has not yet developed itself; but she retains her female voice, and is very jealous of the other females who are not quite so old as she is."

The young male birds of the year are, for a time, in plumage resembling that of the females.

The downy nestling of the Wigeon may be distinguished by the warm rufous tint of the cheeks and throat, and the absence of any loral streak; the upper parts are, moreover, of an almost uniform brown, with hardly any signs of light bars on the pinions.

The tube of the windpipe in the adult male Wigeon is about six inches in length, and nearly equal in diameter throughout; the form of the bony enlargement and the depending bronchial tubes as figured in the vignette below.





MARECA AMERICANA (Gmelin*).

THE AMERICAN WIGEON.

Anas Americana.

THE occurrence of the American Wigeon in a London market during the winter of 1837-8, was thus noticed by the late Edward Blyth, in the third volume of N. Wood's 'Naturalist,' page 417 :—

"The American Wigeon is a novelty which was obtained by Mr. Bartlett. He selected it from a row of Common Wigeons, deeming it, at the time, to be only an accidental variety of the species; there was a female along with it, which, after some hesitation, he unfortunately left, considering it only as a variety, but insufficiently diverse to be worth preserving; he has since, however, positively recognized the female of the American Wigeon to be identical with the bird he thus passed over hesitatingly in the market. The dimensions of the male bird were nineteen inches in length, and thirty-two and a half in extent of wing: the

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[*] *Anas americana*, Gmelin, Syst. Nat. ii. p. 256 (1788).

beak is rather narrower than that of its European relative, and nearly a quarter of an inch longer; the tracheal labyrinth, or rather osseous vesicle, considerably smaller; scarcely exceeding in magnitude that of a Teal."

The Author was indebted to Mr. Bartlett for the opportunity of giving a figure, description, and measurements from this specimen: now in the collection of Mr. J. H. Gurney, and, apparently, the only authentic British-taken example in existence; assuming that it really was killed in this country, of which there is no actual proof. Thompson has asserted his belief that in February, 1844, a second specimen of the American Wigeon was shot by Henry Bell, a wild-fowl shooter, on Strangford Lough, near Belfast; adding that this wild-fowl shooter, who was an intelligent man, and had followed the practice since he was able to carry a gun, was certain of having killed other birds of the same species in Belfast Bay, but never any so far advanced towards the adult male plumage, and therefore the less exciting his attention. He described the bird as "a Wigeon in the plumage of a Teal" (B. of Ireland, iii. p. 112). The example was not preserved. Mr. Thomas Edward, of Banff, states in 1860 (Zool. p. 6970), that he had one which was shot on the Burn of Boyndie in January, 1841; but afterwards he threw it away. Again, in 'The Zoologist' for 1864 (p. 8962) there is the bare—and unquestioned—statement by Mr. S. H. Carter, that "an American Wigeon had been shot on the Essex coast"; and in the same publication for 1870 (p. 2182), a correspondent writes that he had been told that a bird of this species had been shot near Barnstaple! As nothing further has been heard of these rarities, the accuracy of the identification must remain in doubt.

Messrs. Marmottan and Vian state that a female, in the collection of the former, was taken at Le Crotoy, Somme, on the 13th April, 1875. Mr. Dresser has refused this species a place in his 'Birds of Europe'; alleging as his reason, the probability that the examples recorded had escaped from confinement; but against this assumption must be set Mr. P. L. Sclater's statement (P. Z. S. 1880,

p. 514), that, so far as he knows, the American Wigeon has not been imported into Europe.

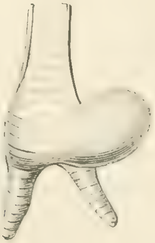
According to the authors of the recently-published 'Water Birds of North America,' this Wigeon is distributed nearly throughout that continent, breeding in the northern latitudes, especially in the west. Adams found it nesting on the small inland lakes near Norton Sound; Mr. Dall, near Nulato and on the Yukon; Kennicott, on the Anderson River, and throughout the Fur-countries generally; and it is said by Dr. Suckley to breed among the inland lakes of Oregon. Throughout British America it is an abundant species in summer. On migration and in winter it visits the greater part of the United States, although somewhat rare in New England. It is numerous on the Chesapeake, where it arrives in October, and, owing to the succulent diet of *vallisneria* grass which it finds there, its flesh rivals that of the renowned Canvas-back. Audubon says that it is abundant during winter at New Orleans, where it is much esteemed on account of the juiciness of its flesh, and is best known by the name of *Zinzin*. In the western country, and in most parts of the Eastern and Middle States, it is called the *Bald Pate*. It frequents the rice-fields of the South; straggles to the Bermudas; and is an annual winter visitant to Mexico, the West India Islands, and Central America.

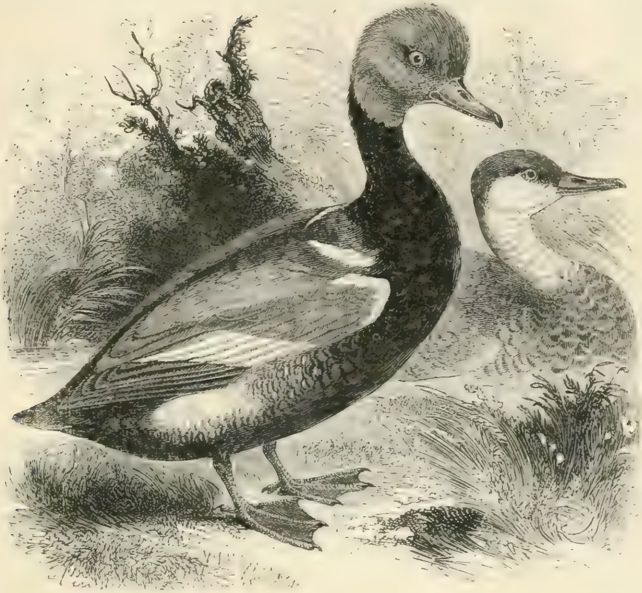
The nest of this species is stated by Kennicott to be always on high dry ground, among trees or bushes, at a considerable distance from water; it is a comparatively small depression among the dry leaves, lined with down, and contains from seven to ten creamy ivory-white eggs, averaging in their measurements 2·2 by 1·5 in. The note is a soft, gentle whistle.

In the bird obtained by Mr. Bartlett the beak is black; the irides hazel; behind the eye a green streak passing backward; forehead and top of the head dull white; neck, cheeks, and occiput, pale brownish-white, freckled with black, the occipital feathers a little elongated; upper part of the back, the scapulars, and part of the wing-coverts reddish-brown, each feather crossed with minute zigzag blackish lines, some of the elongated scapulars falling over the wing-coverts; lower part of the back hair-brown; upper tail-coverts brown, barred with pale brown; tail-feathers uniform brown, slightly elongated and pointed; wing-coverts white, slightly varied with brown; the greater coverts tipped with black; the primaries uniform brown; the outer webs of the secondaries forming a green speculum, tipped with black; outer webs of the tertials blackish-brown, inner web hair-brown; lower part of the neck in front reddish-brown, extending along under the wing to the flanks, which are barred with dark lines; breast, belly, and vent white; under tail-coverts brownish-black; legs, toes, and their membranes dark brown. The whole length is nineteen inches. From the carpal joint to the end of the wing ten inches; the second quill-feather the longest in the wing, but the first almost as long.

The female has the whole head and neck yellowish-white, thickly speckled with black, very little rufous on the breast; the back is dark brown. The young males, as usual, are much like the females during the first season, but the colours are more pronounced and the wing-pattern better defined. They are subject to a regular change every spring and autumn.

The lower part of the trachea, here introduced from Audubon's work, is, as noticed by Blyth, of small size, and decidedly different in form from that of the European Wigeon.





Fuligula rufina (Pallas*).

THE RED-CRESTED POCHARD.

Fuligula rufina.

Fuligula, *Stephens*†.—Bill not longer than the head, but slightly elevated at the base, depressed towards the tip ; sides parallel ; both mandibles laminated, lateral edges of the upper mandible enclosing the edges of the under one. Nostrils at a short distance from the base. Wings rather short, pointed. Legs with the middle and outer toes longer than the tarsus, which is flattened laterally ; feet large, webbed, the hind toe with a broad depending membrane.

The *Fuligulinæ* or Diving Ducks form a tolerably natural sub-family of the *Anatidæ*. The species composing it are distinguished by having the hind toe furnished with a conspicuous membranous lobe ; they are stouter in build, with proportionately large heads and short necks : some of them are inhabitants of salt water during a great part of the year; and all of them dive freely.

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* *Anas rufina*, Pallas, Reise, ii. App. p. 713 (1773).

† Shaw's Gen. Zool. xii. pt. ii. p. 187 (1824).

The Red-crested Pochard or Red-crested Whistling Duck, was first noticed as a straggler to the British Islands by Hunt, who figured in his 'British Ornithology,' ii. p. 333, a female killed at Breydon, in Norfolk, in July 1818. In his 'List of Norfolk Birds,' published in 1829, Hunt records two more shot at Breydon in 1826, and one (now in the collection of Mr. J. H. Gurney) at Surlingham Broad in December 1827. In January 1826, a male was shot near Boston, in Lincolnshire, while feeding on fresh water with some Wigeons, as recorded by the Author (Zool. Journ. ii. p. 492). During the same winter several others were obtained, more than one occurring in the London markets, and were eagerly purchased for collectors, one being secured by Mr. Bartlett (Naturalist, iii. p. 420). In January 1844, an example was obtained at Horsey Mere, near Yarmouth; and one, taken about the same time, near Colchester, passed into the Museum of the Cambridge Philosophical Society. A second occurrence at Boston was recorded in 1854. In February 1867, an adult female was shot at Hickling Broad, near Yarmouth; and there are several other specimens in existence which have been killed in the eastern counties. Mr. John Hancock mentions a female killed in November 1857, at Fenham Flats, Northumberland.

The female represented by Gould in his 'Birds of Europe,' was in the collection of the Hon. W. T. T. Fiennes, and was killed out of a flock of eighteen, at Erith, on the Thames. In February 1845, one was killed at Falmouth, in Cornwall; and an adult male was obtained at Braunton, North Devon, in December 1867. G. R. Gray says that one of two reputed British specimens in our Museum, was presented by Lord Cawdor, and had been shot at Milford Haven; and this is, probably, the example stated by the late Mr. Dix (Zool. s.s. p. 1678) to have been killed at Stackpole (Lord Cawdor's seat), Pembrokeshire.

In Scotland this species has only once been recorded :—a male in the collection of Sir John Campbell-Orde, and exhibited before the Zoological Society by Mr. P. L. Sclater, was shot by Mr. MacDougall, of Lunga, in January 1862, on a fresh-water loch in Argyllshire, where it was in company with some Goldeneyes (P. Z. S. 1862, p. 163). Before the same Society, Mr. A. G. More exhibited a male belonging to Sir R. Payne-Gallwey, shot on the 18th January, 1881, near Tralee, co. Kerry: the only occurrence up to the present in Ireland (Zool. 1881, p. 143).

The Red-crested Pochard has not been proved to occur in Scandinavia; and it is, at most, a rare straggler to Holland, Belgium, and the northern part of France; nor are its visits to the south of the latter country, or to the Swiss lakes, at all frequent. Even in the Spanish Peninsula this beautiful Duck can only be considered as a very local species, almost confined to the lakes of the east side and the Balearic Islands, all of which are rapidly being drained. In Italy it is not uncommon, and readers of Willughby's 'Ornithology' will recollect that our countryman obtained it more than two centuries ago in the market at Rome. In the marshes of Sicily it breeds in some numbers; it has visited Malta on migration; Lord Lilford found it common in winter at Butrinto, Albania; and it occurs rather sparingly in Greece. It breeds in the valley of the Danube; and in suitable localities in Southern, Central, and even Northern Germany; also in Russia, especially in the neighbourhood of the Caspian. Eastward it is found in summer in suitable localities in Persia, Western and Eastern Turkestan, and Kashgaria; its winter range extending over Northern and Central India, where the species is comparatively abundant. Mr. Hume says, that although usually in moderate-sized flocks of from ten to thirty, yet occasionally on large sheets of water they are seen in thousands.

In Northern Africa the Red-crested Pochard is of accidental occurrence in the western part of Morocco; but it breeds sparingly and is resident on the lakes of Algeria, where Canon Tristram and Mr. Salvin found its nests. It appears to be rare in Egypt, neither Capt. Shelley nor

Mr. J. H. Gurney, jun., having met with it; but the latter has subsequently received a specimen from Damietta.

A young male Red-crested Pochard was obtained in Fulton Market, New York, on the 2nd of February, 1872, by Mr. G. A. Boardman, and had undoubtedly been shot in the vicinity. It may be doubted if the presence of this solitary individual in the United States was due to natural causes.

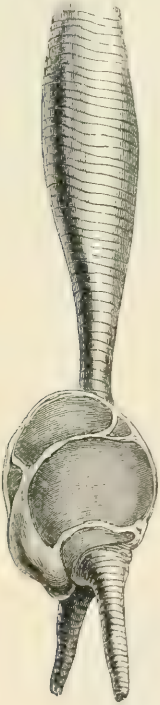
The nest of this species is placed in the rushes or flags, in ponds or open pools of moderately deep water; the eggs, from seven to nine in number, being described by Mr. Salvin as of a most brilliant fresh green colour when unblown, but when emptied the delicate tint fades; average measurements 2·3 by 1·6 in.

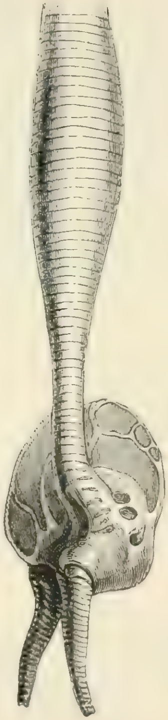
Although one of a sub-family the members of which, as Mr. Dresser correctly states, are all good divers, yet he subsequently asserts (B. of Europe, vi. p. 563) that this species does not dive, but feeds like the Mallard. The very reverse is the experience of the Editor, who has had considerable opportunities of observing this bird on the Albufera of Valencia, and has seen it dive repeatedly, although unmolested; in fact, it frequents water of such depth that it must necessarily dive to obtain its food, which consists largely of water-weeds; also of frogs, small fish, insects, &c. The call-note, which, according to Mr. Hume, is seldom heard by day unless the bird is alarmed, is a deep grating *kurr*; but occasionally the male utters a sort of whistle. Major E. A. Butler says that this is one of those wary birds which severely try the sportsman's patience; taking wing on the slightest indication of danger, and flying up and down the tanks, invariably out of gunshot.

Mr. Sclater states (P. Z. S. 1880, p. 524), that in spite of every care lavished upon several pairs selected from twelve males and six females from the Punjaub, presented to the Zoological Society by Mr. E. C. Buck, they refused to reproduce *inter se*; but in 1879 five curious hybrids were produced on the pond on which they were kept; apparently the result of a cross between this species and the Antarctic

Rosy-billed Duck, *Metopiana peposaca,* which was in the same enclosure.

The windpipe of the male is about nine inches in length; the tube is narrow in diameter at the middle and near the end, but enlarged at the commencement and again below the middle, as shown in the representation of the lower half. The labyrinth in the Ducks of this division is composed partly of bone, and partly of membrane. The right and left surface are here shown; the membrane supported by delicate portions of bone diverging from an outer bony ring.





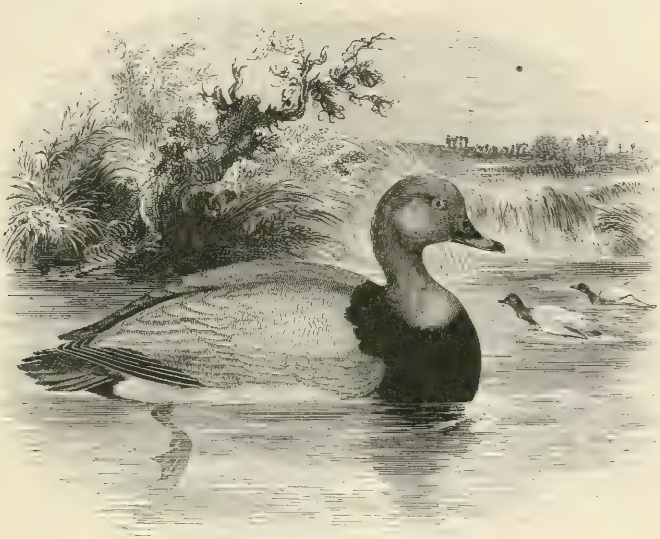
In the adult male in spring the beak is crimson or vermilion-red; the nail white; the irides reddish-brown; the whole of the head, and the upper part of the neck all round rich reddish-chestnut, the feathers on the top of the head considerably elongated, forming a conspicuous crest; the back of the neck below, and the upper tail-coverts dark brown; the back, and a portion of the scapulars, wing-coverts, and tertials, yellowish-brown; a white patch on the carpal joint of the wing, and another over the joint; greater coverts ash-brown; wing-primaries and tail-feathers greyish-brown; the secondaries with the outer webs white, forming a speculum; front of the neck, breast, belly, and under tail-coverts rich dark brown; the sides and flanks white, with an evanescent salmon-pink tinge; legs and toes vermilion-red, interdigital membrane almost black. In less mature birds the bill, legs, and feet are much duller in colour.

The whole length is twenty-two inches. From the carpal joint to the end of the first quill-feather, which is the longest in the wing, ten inches and a half.

The female is without a crest; the top of the head dark brown; cheeks, throat, and sides of the neck greyish-white; upper surface of the body pale rufous-brown; point of the shoulder and the speculum greyish-white; breast reddish-brown; the other parts of the under surface greyish-brown; beak and legs reddish-brown.

The young male resembles the female, but is more rufous about the head and soon begins to develop a crest.

ANSERES. *ANATIDÆ.*



Fuligula ferina (Linnæus*).

THE POCHARD,

OR DUN-BIRD.

Fuligula ferina.

The Pochard, or Dun-bird (for this species is known by various names, as Red-headed Poker, and Red-eyed Poker, from the prevailing colour of the head, and the peculiar colour of the eye not observed in any other British Duck), is, in the main, a winter visitor to this country, appearing about the beginning of October, and leaving us again in the spring. A tolerable number, however, remain to breed in suitable localities; and, owing to efficient protection, they appear to be on the increase. Messrs. Sheppard and Whitear, in their 'Catalogue of Norfolk Birds,' published in

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* *Anas ferina*, Linnæus, Syst. Nat. Ed. 12, i. p. 203 (1766).

1825, stated that this species then nested at Scoulton Mere, a spot which has been abandoned for many years; but at present it undoubtedly breeds on Lord Walsingham's estate at Merton, and, probably, in some other localities in Norfolk. Hornsea Mere, in Yorkshire, has long been a well-known and favourite station, and, according to Mr. W. E. Clarke, about fifty pairs were there in 1881; there are a few other places in the same county; and Mr. R. J. Howard informs the Editor that since the introduction of a pair of pinioned birds on some reservoirs in Lancashire, several broods have been annually reared there. Of late years a moderate number have nested in Dorsetshire; and there may be some other small and isolated colonies, respecting which it is unnecessary to be more explicit.

In Scotland it is a generally distributed and familiar species, and Mr. Harvie-Brown informs the Editor that it undoubtedly breeds on a loch near Doune. In Ireland it is stated by Col. Whyte ('The Field,' June 2nd, 1877) to have nested on his property in co. Sligo; and Sir R. Payne-Gallwey adduces evidence of its having done so on Lough Derg, and Lough Beg. In the winter the species is very abundant.

While here, it resorts to inland lakes and rivers, as well as the sea-shore, and though a difficult bird to take in a decoy owing to its shyness and caution, and the facility with which its expertness in diving enables it to get back under water in the pipe, yet, from its abundance as a species, great numbers are often taken; thousands having been sold in some winters in the London markets. Montagu mentions that the method formerly practised for taking the Pochard was something similar to that of taking Woodcocks. Poles were erected at the avenues to the decoys, and after a great number of these birds had collected for some time on the pond, to which wild-fowl resort only by day, and go to the neighbouring fens to feed by night, a net was at a given time erected by pulleys to these poles, beneath which a deep pit had previously been dug; and as these birds, like the Woodcocks, go to feed just as it is dark, and are said always to rise against the wind, a whole flock was sometimes taken together in this manner; for if once they strike against the net, they never attempt to return, but flutter down the net till they are received into the pit, from whence they cannot rise, and thus we are told twenty dozen have been taken at one catch.

Pochards are in general remarkable for the excellence of their flesh, and are probably little inferior to the far-famed Canvas-back Duck of the United States, which they very closely resemble in the colour of their plumage; but our bird is the smaller Duck of the two. Pochards are best while they feed at the mouths of rivers and about fresh-water, where they live almost entirely on aquatic plants; but when they feed at sea, on crustacea and mollusca, they are coarse and ill-flavoured. They feed principally during the night. When not excited or alarmed, their note is a low whistle, but at other times it is a rough croak. Pochards are not so slender and elegant in form as the more surface-feeding Ducks, but are short in the body, depressed in form, swimming low in the water, and bad walkers, from the backward position of their legs; an arrangement of great service to them as swimmers and divers.

The nest is placed amongst the rushes, or other coarse herbage, on the margins of inland waters; the eggs, from seven to ten in number, are of a broad oval shape and greenish-drab in colour; the average measurements being 2·3 by 1·6 in.

The Author has seen a Duck which had all the appearance of having been bred between the Pochard and the Ferruginous Duck (the species next in succession); and Mr. Bond has an undoubted hybrid resulting from this union. It appears to be the so-called 'Pagets' Pochard,' described by Mr. W. R. Fisher (Zool. pp. 1137, 1778), shot on Rollesby Broad, Norfolk, and now in the possession of Mr. J. H. Gurney, who has a second example, shot in the same county in February 1859. This hybrid has been named *F. homeyeri* and *F. ferinoides*. In captivity the Pochard has been known to breed on several occasions, but not very freely.

To the Færoes and Iceland the Pochard appears to be only a rare straggler; nor is it at all common in any part of Scandinavia, although in Russia its breeding-range extends as far north as Lake Ladoga. A tolerable number nest in Denmark, Northern and Central Germany, Poland, and, in fact, where suitable localities present themselves, over the greater part of Europe down to the Mediterranean, to which considerable flocks resort in winter. It is abundant in North Africa; some are believed to breed in Algeria; and eastward its range extends through Asia Minor, Turkestan, and Central Asia to the Baikal district, but not further north. It is common in many parts of India down to Calcutta in winter, at which season it visits China and Japan. In America it is replaced by a closely-allied species, *F. americana*, which is larger, with a broader, shorter, and differently coloured bill, and also presents some slight but constant distinctions in plumage.

The adult male Pochard has the bill black at the point and the base; the intermediate portion pale blue, forming a broad transverse band; the irides red; the head and upper part of the neck all round rich chestnut-red; the neck below deep black; back, scapulars, tertials, and wing-coverts, freckled over with minute grey specks and lines on a ground of white; primaries and secondaries nearly uniform grey, the primaries ending in dark brown, the secondaries narrowly tipped with white; rump and upper tail-coverts nearly black; tail-feathers uniform greyish-brown; breast, sides, and belly to the vent, greyish-white, produced by minute grey marks, on a white ground; under tail-coverts black; legs and toes bluish-grey, the intervening membranes bluish-black.

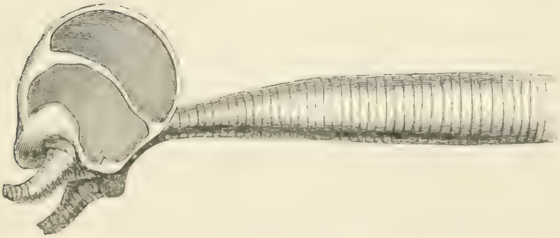
The whole length is nineteen inches and a half. From the point of the wing to the end of the first quill-feather, which is the longest, eight inches and a quarter.

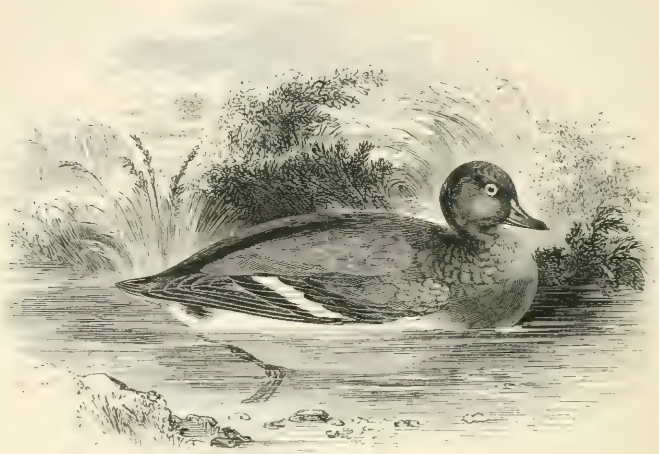
The adult female has the bill black; the irides brown; head, and all the back of the neck dusky greyish-brown; back and wings darker grey than that of the males; quill-feathers like those of the males; no bright-coloured speculum in either sex; chin and throat pale greyish-brown; lower part of the neck in front dark brown; all the under surface of the body uniform dull greyish-white; under tail-coverts dark grey; legs and feet as in the male.

Young males at first resemble the females, obtaining some change with the feathers of their first autumn moult; the alteration in the colour of the feather going on by slow degrees afterwards. As late as the middle of January, young males of the previous summer had not attained their perfect plumage; and the black on the breast of the young males does not make its appearance during the first year.

The nestling is described by Naumann as having the head and neck dull rusty-brown; upper parts blackish-brown; under parts yellowish-white; bill and feet pale bluish.

The trachea of the male is about eight inches long; the diameter of the tube large, tapering suddenly towards the bottom; the labyrinthic tympanum of beautiful form; bronchial tubes short. The engraving below represents the surface opposed to the left side of the bird.





FULIGULA NYROCA (Güldenstädt*).

THE FERRUGINOUS DUCK,

OR WHITE-EYED DUCK.

Fuligula nyroca.

THOUGH somewhat resembling in colour the Pochard or Dun-bird last described, the Ferruginous or White-eyed Duck is at once distinguished from it by its smaller size, its dark brown back, and by the centres of its secondary quill-feathers being white; forming a broad white bar on the wing at all ages. The Ferruginous Duck is only an irregular visitor to this country, principally in winter and spring. Its occurrences in Norfolk have been more frequent than in any other part of the British Islands, and Mr. J. H. Gurney, jun., says that in that county it is something more than an accidental straggler, although Mr. Stevenson does not mention many instances, and those mostly between January and April. It has also been obtained in Suffolk and Cambridgeshire. At long intervals it has occurred in the Humber district and in Yorkshire (twice at Coatham, near the mouth of the Tees); also along the Trent valley and in other parts of Nottinghamshire, according to Mr. Whitaker, several have been seen and three have been obtained: two of them in 1877 and 1878. Mr. Hancock is not aware of any occurrence in Northumberland, except the one near Hexham mentioned by Selby; and in Cumberland the only instance appears to be that of a female, purchased in Carlisle market about the year 1850, as the Editor is informed by the Rev. H. A. Macpherson.

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* *Anas nyroca*, Güldenstädt, Nov. Com. Petrop. xiv. p. 403 (1769).

Examples are not unfrequently seen in the London markets —generally, according to Mr. J. H. Gurney, jun., in the month of November—and are said to come from the counties between the Thames and the Humber; but it is probable that most of them are really brought from Holland, whence also live birds are sometimes sent. Two were killed near Oxford, in the winter of 1832, and another pair during the winter of 1844, for a notice of which the Author was indebted to Mr. W. Borrer. Mr. J. C. Mansell-Pleydell records a bird of this species obtained on the Wareham river in January 1879, the first occurrence known to him in Dorsetshire. Mr. Gatcombe is aware of but one instance of the occurrence of a young bird of this species in Devonshire, and Mr. Rodd does not mention it as a visitor to Cornwall. In Radnorshire a remarkably tame bird was observed by Sir Harford J. Jones-Brydges, frequenting a pond during the winter and up to March, 1859.

In Scotland, the late Sir William Jardine, writing in 'The Naturalist's Library' prior to 1843, says that he once found a fresh bird of this species in the Edinburgh market; and an example shot near Musselburgh in 1855, was exhibited at a meeting of the Royal Physical Society of Edinburgh on the 26th December by Dr. J. A. Smith. In Ireland the occurrence of this species was first recorded by Mr. H. Blake-Knox, who says that he shot an adult male in March 1871, off the Dublin coast; and in the same month another was sent to him, procured off Antrim (Zool. s.s. p. 2645).

Sir R. Payne-Gallwey states that in 1879 he observed on the east coast two Ducks of a very unsuspicious nature, which, on being secured, proved to be Ferruginous Ducks ('Fowler in Ireland,' p. 101).

On the Continent the summer range of this species extends little, if at all, beyond 57° N. lat., and Mr. Benzon does not think that it breeds in any part of Denmark proper; although it does so in Schleswig-Holstein, Northern Germany, the Netherlands, and, perhaps, in the northern portion of France. In Russia, Mr. J. H. Gurney, jun., obtained a nestling not half fledged, in the Moscow market, on the 16th of September; and southwards the species is found breeding in Russian Poland, Galizia, the valley of the Danube, and, in fact, in suitable localities throughout the greater part of Central and Southern Europe, down to Spain on the west and the Volga on the east; its numbers in the southern districts being largely augmented during the cold season by migrants from the north. It straggles to the Canaries; breeds in Morocco and Algeria; and is abundant in winter along the Nile valley as far as Nubia. Both on migration and in the breeding-season, it is found in Asia Minor, and, often at considerable elevations, in Persia, Eastern and Western Turkestan, Kashgaria, and Kashmir; in the latter, according to Mr. Hume, boat-loads of its eggs are brought into Srinugger market in the season. During the cold weather it is found in suitable localities throughout Northern and Central India: probably as far east as Chittagong, and, according to Blyth, in Arrakan. Dr. O. Finsch makes the remarkable statement that he found it at Obdorsk, near the Arctic Circle; but it is not mentioned by any authorities on the ornithology of Mongolia or China, with the exception of the Abbé David, who says that it is common in spring in the province of Pekin; and it has been obtained in Japan. The accuracy of Fabers' identification of it in Iceland may reasonably be doubted, as may also that of Mr. March as to Jamaica.

The nest is described by Lord Lilford as placed amongst high rushes, at a short distance from the water, and composed of dry water-plants, flags, &c., lined with thick brownish-white down, and a few white feathers. The eggs, seven to twelve in number, are of a pale buff-colour with a faint evanescent greenish tinge; average measurements 2·1 by 1·5 in.

The food of the Ferruginous Duck consists principally of vegetable matter, varied with insects and their larvæ, small mollusks, crustaceans, &c.; and the fitness of this Duck for the table appears to depend greatly upon the previous diet. Col. Irby, Prof. Taczanowski, and others, consider it a very good bird; but Mr. Hume's experience is the reverse. In its diving powers, this species can hardly be surpassed; but it rises heavily, and is not remarkably rapid when on the wing, at which time it has a very dark appearance, and by this and its white wing-bar it may easily be recognized. The note is a harsh *kirr, kere, kirr*. In captivity Mr. J. H. Gurney has known a bird to live for fifteen years.

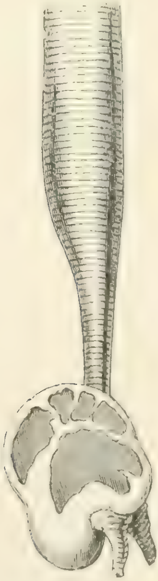
In the adult male the bill is bluish-black; the irides white (whence the name of White-eyed Duck); the whole of the head, the neck all round to the upper part of the breast and the sides, rich chestnut-brown; round the middle of the neck a narrow brownish ring; the whole of the back and wing-coverts umber-brown, with a tinge of green; primary quill-feathers dusky-black, part of the inner webs white; the secondaries white, forming a bar of that colour on the wing, but the extreme ends are black; tail-feathers brownish-black; on the chin a small triangular spot of white; lower part of the breast and the belly white; the flanks brown; vent greyish-brown; under tail-coverts white; legs and toes bluish-black, the membranes darker. The whole length is sixteen inches; the wing, from the carpal joint seven inches and three-quarters. The first quill-feather the longest in the wing.

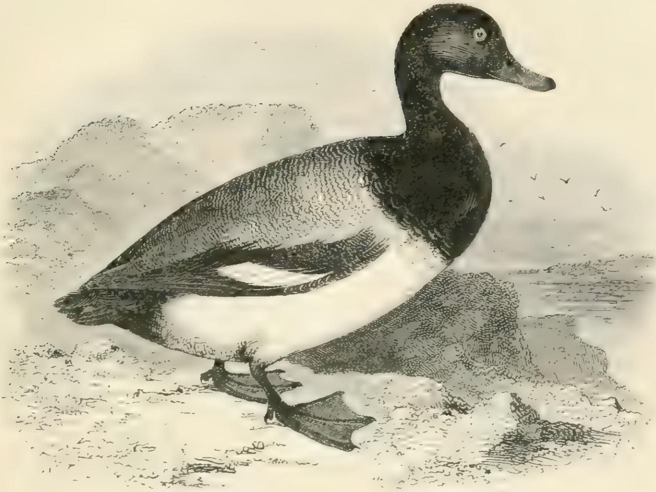
In the female the irides are not so white; the whole head and neck deep reddish-brown, darker in tint, but not so rich in appearance as the same parts in the male: wings like those of the male; lower breast and belly usually dingy-white, but sometimes as white as in the male; rather smaller size.

The young bird of the year is notably smaller, and has still less of the red-chestnut tint than the adult female; the back, wings, and neck, are of two shades of brown, the edges of the feathers being of the lighter colour; breast and belly dull brownish-grey.

In a nestling lent to the Editor by Mr. E. Bidwell, the dark brown of the crown of the head, hind-neck and upper parts, is very sharply defined against the clear yellowish-buff of the cheeks, front of the neck, and breast; flanks dark brown. As a rule, nestlings of the Diving Ducks may be distinguished from those of the *Anatinæ* by the absence of light spots on the back; but the young of the Ferruginous Duck shows a distinct bar of lighter colour on the pinion and the adjacent portion of the body.

The trachea of the male is about six inches in length; the tube is small at both ends, but enlarged in the middle; the portion represented below is of the natural size.





FULIGULA MARILA (Linnæus*).

THE SCAUP DUCK.

Fuligula marila.

THE SCAUP DUCK is a winter visitor to this country, and rather a late one, seldom making its appearance till the end of October, or the beginning of November. About that time, particularly if the weather be rough and cold, small flocks arrive on various parts of the coast and at the mouths of rivers, but do not often visit the waters of inland counties. They appear to prefer low, flat, muddy, or oozy shores, and are often numerous throughout the winter months on such portions of our coasts, where, in company with Tufted Ducks, Golden-eyes, and other species, they are sometimes pursued by wild-fowl shooters in their gunning-punts, and also occasionally caught by fishermen in upright nets fixed in curving lines on perpendicular stakes in shallow bays.

[*] *Anas marila*, Linnæus, Syst. Nat. Ed. 12, i. p. 196 (1766).

The Scaup Duck, however, in the Old World, where it feeds on small fish, mollusks, aquatic insects, and marine plants, is by no means in request for the table, as its flesh is generally coarse, dark in colour, and fishy in flavour. The greater part of its food is obtained by diving, at which it is very expert, but, like most of the short-winged diving-ducks, it gets upon wing from the surface of the water but slowly, prefers rising against the wind, and flies at a moderate pace. What it wants, however, in speed, it appears to make up in caution, and it is considered a difficult bird to approach.* Its name of Scaup Duck is, according to Willughby, derived from the bird feeding among broken shells, which are called scaup; or on the beds of oysters and muscles which are in the north called oyster scalp, and muscle scalp [scallop].

Montagu, who kept both sexes of this species alive in confinement many years, observed "that they associated together, apart from all other Ducks, made the same grunting noise, and both had the same singular toss of the head, attended with an opening of the bill, which, in the spring, is continued for a considerable time while swimming and sporting on the water. This singular gesture would be sufficient to identify the species, were all other distinctions wanting."

In the case of one female which died, Montagu states that "the cause of death appeared to be in the lungs, and in the membrane that separates them from the other viscera; this last was much thickened, and all the cavity within was covered with *mucor*, or blue mould. It is a most curious circumstance to find this vegetable production growing within a living animal, and shows that where air is pervious, mould will be found to obtain, if it meets with sufficient moisture, and a place congenial to vegetation.

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* [The above is the Author's statement. Mr. A. Chapman, who has had much experience on the Northumberland coast, where this species is known by the name of 'Covie,' says that it is the tamest of the Duck-tribe, and it is easy to take a punt within short range; it takes very hard hitting, and, when obtained, is uneatable.—Ed.]

Now the fact is, that the part on which this vegetable was growing was decayed, and had no longer in itself a living principle; the dead part, therefore, became the proper pabulum of the invisible seeds of the *mucor*, transmitted by the air in respiration; and thus nature carries on all her works immutably under every possible variation of circumstance. It would, indeed, be impossible for such to vegetate on a living body, being incompatible with vitality, and we may be assured that decay must take place before this minute vegetable can make a lodgment to aid in the great change of decomposition. Even with inanimate bodies the appearance of mould or any species of *fungi*, is a sure presage of partial decay and decomposition."

M. De Selys Longchamps found a similar growth lining the air-cells in the lungs of an Eider Duck;* and Mr. [now Sir Richard] Owen described the same appearance as found by himself in the bronchial tubes of a Flamingo.† References to descriptions and figures of various singular vegetable growths on insects will be found in the first Part of the third volume of the Transactions of the Entomological Society of London; and those acquainted with Edwards' Gleanings in Natural History, will remember his coloured representations of grubs and wasps exhibiting vegetation, in plates 335 and 336.

In spring, the Scaup Ducks take their departure from our shores; and although it is possible that some pairs remain to breed in Scotland, the evidence on this point is not yet quite complete. Selby wrote in his notice of the birds found when exploring Sutherlandshire in the month of June, 1834:—"A single female was shot by Sir William Jardine, in a small loch between Loch Hope and Eriboll; she was attended by a young one, which unfortunately escaped among the reeds," but, in a subsequent communication to Mr. Harvie-Brown, the late Sir William Jardine expressed some doubts as to the identification of the young bird. In June 1868, Mr. Harvie-Brown shot an adult male Scaup on a loch in the west of Sutherlandshire, when the bird's unwillingness to leave, even when repeatedly disturbed, led him to think that the female was not far off; and further evidence is given in the Pr. Nat. H. Soc. Glasgow, 1875, p. 120. Mr. A. C. Stark says (Pr. R. Phys. Soc. Edin. vii. p. 203) that at Loch Leven, on the 15th May, he saw about forty Scaups, all paired, and on the 5th June he saw five pairs there. The following day he flushed a female Scaup from a nest containing eleven fresh eggs in an isolated clump of rushes close to the side of the loch, and he adds that the bird alighted on the water and afforded a good opportunity for examination through a telescope.

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* Ann. Nat. Hist. viii. p. 229.

† Pr. Zool. Soc. 1832, p. 142.

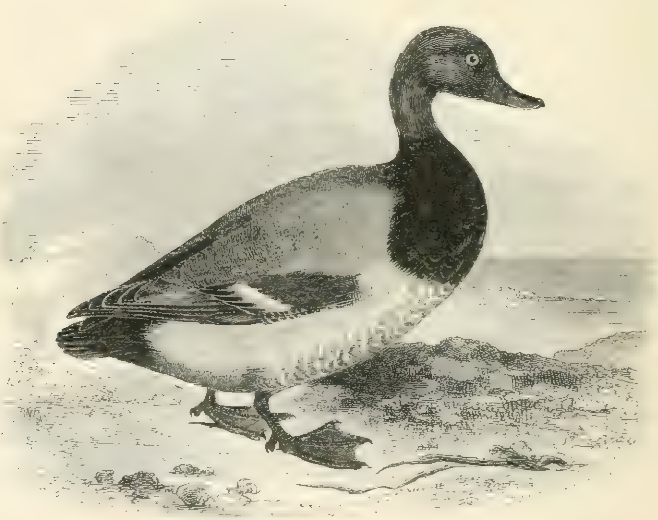
In the Færoes, where the Scaup is common in autumn and winter, a few remain over the summer, and Major Feilden observed a single pair on a small lake so late as the 20th May, 1872. The late Mr. Proctor sent the Author word that the Scaup Duck is a very common species in Iceland, where it breeds either among the aquatic herbage, or the large stones, near the edge of fresh water, making a slight nest, with a quantity of down covering the eggs, which are from five to eight in number, of a uniform clay-buff colour; average measurements 2·6 by 1·75 in.

As regards Scandinavia, the late Mr. Richard Dann supplied the Author with the following note:—"The Scaup Duck, in its migration south, does not make its appearance on the western coast of Europe until late in the winter, and then only in comparatively small numbers; its migration appears to be more southerly than westerly. It breeds on the swampy lakes towards the north of the Bothnian Gulf, near Lulea, in considerable numbers. I have shot the young there previously to their being able to fly. I have seen them about Gellivara and Lulea in small numbers. Being a diving-duck they avoid the reeds, and keep out in the open water. They are, also, tolerably numerous in the Dovre Fjeld mountains, frequenting and breeding near swampy solitary lakes as high as the birch-wood grows. At whatever season the Scaup Duck is shot, it is generally very fat and heavy."

According to Blasius, this Duck has been known to breed in one instance on the Hiddensee, in Brunswick; but on the shores and inland waters of the Continent south of the Baltic, it only occurs, as a rule, in winter and on migration, becoming rare in the western portions of the Mediterranean, although not uncommon in the east, and in the Black Sea. Considerable numbers winter in Egypt, and Von Heuglin saw a pair in Abyssinia. It breeds abundantly in northern Russia, and throughout northern Siberia as far as the Pacific, migrating southwards to northern India, Lake Baikal, Dauria, China and Japan. In North America this species is abundant and widely distributed, being found on the coast and the interior waters from the Pacific to the Atlantic. Its breeding-range appears to be north of the 50th parallel; its migrations extending southwards to Mexico and the West Indian Islands. According to Dr. Bryant, immense flocks, covering acres of water, are sometimes to be seen off the Bahamas. In the Chesapeake, where it feeds on the *vallisneria* grass, it becomes very fat, the flesh being then tender and juicy, entirely free from the strong fishy taste acquired in other localities. In Greenland the Scaup is of rare occurrence.

In North America, occupying about the same area as our bird, is found a smaller form—of doubtful specific distinctness—known as the American or Lesser Scaup Duck, *Fuligula affinis*, Eyton (*F. mariloides*, Vigors). Under the impression that a Duck obtained in the London market, by the late Mr. Henry Doubleday, belonged to this species or race, the identical specimen was figured in former Editions of this work, under the name of the American Scaup. This example, which is now in the collection of Mr. F. Bond, is believed by that veteran ornithologist, and by other competent naturalists, to be a hybrid between the Scaup and the Pochard; but whatever it may be, it is certainly not the American Scaup. The illustration of this specimen is given on the following page.

In the adult male the bill is pale blue; in form, narrowest at the base, dilated considerably towards the point, being nearly one-third wider; the nail curved and black; the irides yellow; the head and the neck all round, as well as the upper part of the breast and back, black; the cheeks and sides of the neck glossed with rich green; the rest of the back and the scapulars spotted and striped with broadish black lines, on a ground of white, with considerable intervals between the lines; the wing-coverts of much darker grey than the back; the wing-primaries brownish-black; the secondaries white, forming the speculum, but tipped with black; tertials as dark a grey as the smaller wing-coverts;

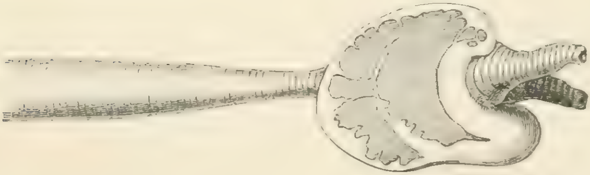


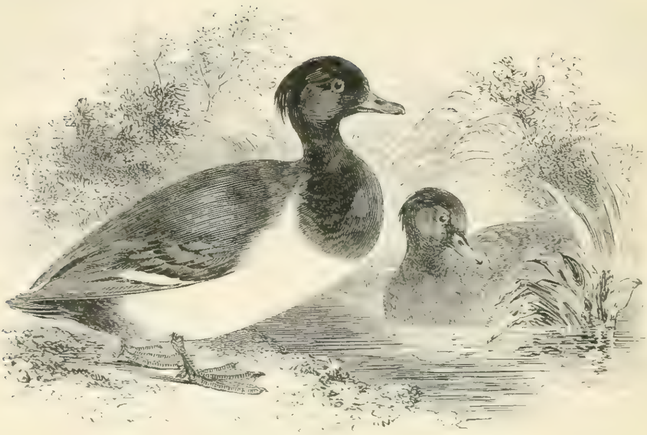
rump and upper tail-coverts black; tail-feathers brownish-black; breast, sides below the wing, and the flanks pure white; the portion of the belly behind the legs marked with greyish lines, on a ground of white; under tail-coverts black; legs and toes bluish-black, the intervening membranes darker. The whole length is eighteen inches. From the carpal joint to the end of the wing nine inches; the first and second quill-feathers very nearly equal in length, but the first rather the longer of the two.

In the female, which is so different in appearance as to have been described as a distinct species under the name of the White-faced Duck, the head and neck are of a dark brown colour ; the beak lead-colour ; around the base of the beak in old females, a broad band of white ; the lower part of the neck and breast dark brown ; the back and scapulars light grey, transversely barred with irregular dusky lines ; the greater quill-feathers dark brown ; the secondaries white, tipped with dark brown ; the tail-feathers also dark brown ; the belly dirty-white ; under tail-coverts dusky-black ; the legs and toes dusky-blue, the webs black. The female is nearly as large as the male, and from the broad white band occasionally to be found around the base of the bill, has been figured and described as a distinct species under various names.

Young birds resemble the females, generally, but the light colour on the back is varied with brown spots. By the month of January the young male has nearly assumed the glossy black head, but the mottled whitish patch at the base of the bill is still present, and the breast is still brownish and not black.

The nestling is unspotted umber-brown above, yellowish-brown to white on the under parts ; hardly to be distinguished from the young of the Tufted Duck, unless by the somewhat greater breadth of its bill at the point.





FULIGULA CRISTATA (Leach*).

THE TUFTED DUCK.

Fuligula cristata.

THE TUFTED DUCK is best known as a regular autumn and winter visitor to this country, frequenting our sea-coasts, estuaries, and lakes, where it generally remains till March. During that portion of the year it is frequently seen in company with the Pochard, the Scaup, the Golden-eye, and other diving-ducks, but also in small parties, and sometimes in pairs only. It is a plump, short bird, depressed in form, swimming low; and although it frequents our fresh waters in considerable numbers, it is considered a difficult Duck to take in a decoy, on account of the facility with which it dives and gets back in the pipe towards the open entrance and the pool.

A tolerable and, apparently, increasing number of Tufted Ducks remain to breed in the British Islands, and nowhere more abundantly than in Nottinghamshire, a county in which the species has been known to nest for at least thirty-five years. In 1851 Messrs A. and E. Newton were informed by the bailiff of Lord Galway that a pair had annually reared a brood at Serlby for the past two or three years; and in 1854, Mr. F. Foljambe described an authenticated nest with eggs, found at Osberton. At present its head-quarters appear to be on the ponds at Newstead Abbey, Rainworth, Clumber, Welbeck, Rufford, &c., and several ornithologists, including the Editor, have had excellent opportunities for observing the birds during the breeding-season on the Rainworth waters, the property of Mr. J. Whitaker.* During the last few years this species has spread to South Yorkshire, several pairs having been found breeding at Wentworth Park; and in the north-western portion of that county it has bred on Malham Tarn. In Lancashire, Mr. R. J. Howard found it nesting at Woodfold Park in July 1884, some of the young birds being subsequently captured, pinioned and turned down again, by Mr. Daniel Thwaites, the proprietor. In Northumberland it has been known to nest on several occasions. Westward, it probably breeds on the meres of Staffordshire and Shropshire; and in the south, Mr. W. Borrer has recorded broods near Horsham and West Grinstead, in Sussex. On the east side of England the fact of its nesting in Norfolk was first authenticated by Lord Walsingham in May 1876, since which date it has considerably increased both in numbers and distribution.

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* *Anas cristata*, Leach, Cat. M. and B. Brit. Mus. p. 39 (1816).

In Scotland the first announcement was given by the late Mr. A. B. Brooke, who met with broods on Butterston Loch, Perthshire; and since then it has evidently increased, numbers now breeding on Loch Leven. In Ireland, where the Tufted Duck is very numerous in winter, it is known to nest in several localities; in the north, the Rev. G. Robinson and Major E. A. Butler supply evidence that it does so on Lough Neagh, and Lough Beg; and Mr. R. Evatt of Mount Louise, co. Monaghan, informed Sir R.

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* Further details will be found in Messrs. Sterland and Whitaker's 'Birds of Nottinghamshire,' pp. 57-63.

Payne-Gallwey that the Tufted Duck brings forth its ragged, sooty-looking little brood, every year, on the lake in his grounds.

In the Færoes it is stated by Mr. Collin to have bred in June 1872; but its reported occurrence in Iceland by Faber is unconfirmed by any subsequent observers; and the same may be said of Greenland. Although not numerous, it is generally distributed during the breeding-season throughout Norway, becoming more abundant in Sweden; also in Finland, and Russia up to 68° N. lat. In Denmark it nests occasionally; and it does so regularly in some districts of Northern and Central Germany. Over the rest of Europe it is found on migration, in varying numbers, down to and throughout the Mediterranean basin; ranging as far south as Abyssinia, where Mr. Blanford found it in pairs on Lake Ashangi in May, at an elevation of 8,500 feet. Eastward it can be traced through the Caspian district to Turkestan, Kashgaria, Dauria, and Mongolia, in summer; and during the cold season considerable numbers visit Northern and Central India, China, and Japan.

According to Mr. Whitaker, the Tufted Duck pairs in March, but incubation does not commence before the end of May or the beginning of June. The nest is usually placed under some bush or tuft of sedge, and the eggs, from eight to thirteen in number, are of a greenish-buff colour; average measurements 2·4 by 1·65 in. The call-note, on alighting, is rendered by Mr. Whitaker by the words 'currugh, currugh,' uttered gutturally; and his experience is that, when both birds are together, the female is invariably the first to rise. They dive freely and frequently. As regards the merits of this species for the table, they depend upon its food; when this has consisted principally of aquatic plants, the bird is good enough, but at other times, even from Nottinghamshire waters, the result is not satisfactory, in spite of the removal of the oil-gland before cooking.

Mr. Whitaker states that in 1878 a nest of the Tufted Duck was mown out, and the eggs were safely hatched out under a hen, the birds going off to the lake when full grown, after which all trace of them was lost. The following June a Tufted Duck made its appearance in the poultry-yard, answered to the accustomed call, and took food from a saucer for several days, until one morning it was accompanied by eleven young ones. Tufted Ducks bred in confinement in the ponds at the Gardens of the Zoological Society, during the summers of 1839 to 1848. Mr. Sclater says that in 1849 a Tufted Duck crossed with a Ferruginous Duck (*F. nyroca*), and the hybrids thus produced continued to breed either *inter se* or with one of the parents, till 1861 (P. Z. S. 1880, p. 524). Major E. A. Butler informs the Editor that there is in the Belfast Museum a bird shot near Downpatrick, which is apparently a hybrid between the Tufted Duck and the Pochard. In general appearance it takes after the latter, but it is much darker, has a rudimentary crest, and the feathers of the neck have a purple gloss. The result of a cross between a male of the American Wood Duck (*Aix sponsa*) and a female Tufted Duck is described by Baillon.

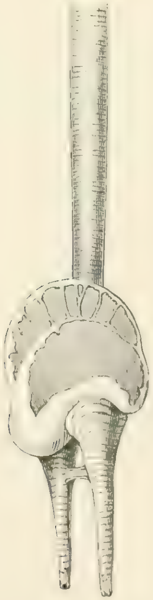
The adult male has the bill pale blue, except the nail, which is black; in form nearly parallel, or but little dilated towards the point; the irides brilliant golden-yellow; the head and neck glossy purplish-black; the back, rump, tail, and wings, black, except a small portion of each of the secondaries of the wing, which is white, forming a white bar, or speculum, but tipped with black; the sides of the head, behind and below the eyes, are tinged with purple; the occipital feathers considerably elongated, forming a crest or tuft, from which the bird derives its name; at the chin a small triangular spot of white; breast, belly, sides, and flanks, pure white; vent and under tail-coverts black; legs and toes dark blue, the webs black. The whole length of the bird is seventeen inches; of the wing, from the carpal joint to the end, eight inches; the first and second quill-feathers nearly equal in length.

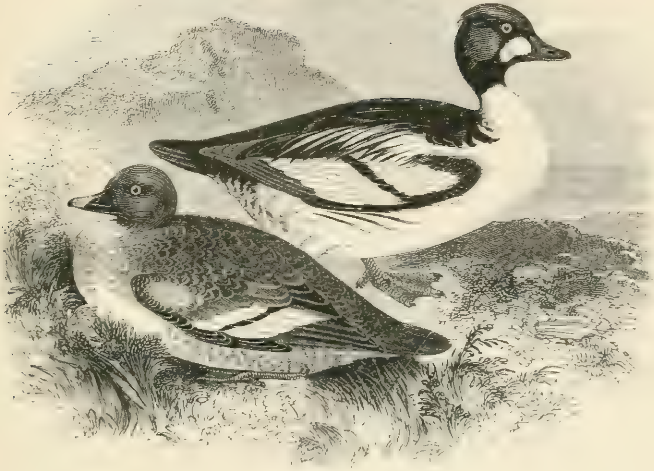
The female is dark brown on all those parts which in the old male are black; the white of the under surface of the body less pure in colour, being tinged with grey, or pale ash-brown; the speculum of the wing white, as in the male. Weight 1½ lbs. The Author has seen a dead female that was known to be old, with the feathers at the base of the upper mandible speckled with white, like the adult female of the Scaup; and with some elongation of the occipital feathers.

The young male resembles the female; but he is larger, and by the end of September he has begun to assume the dark head, although there is as yet no sign of a tuft. Weight 1¾ lbs.

The very young nestling is with difficulty to be distinguished from the young of the Scaup, but the bill is somewhat smaller and narrower at the tip.

The trachea in the Tufted Duck is about seven inches long, the tube somewhat larger at the upper end, below that of nearly equal diameter throughout; the figure underneath shows the form of the tympanum.





CLANGULA GLAUCION (Linnæus*).

THE GOLDEN-EYE.

Fuligula clangula.

CLANGULA, *Boie*†.—Bill much shorter than the head, higher than broad at the base, depressed towards the tip, which is slightly pointed ; unguis large, elliptical and decurved at the tip ; lamellæ completely hidden by the overhanging edge of the maxilla ; nostrils near the middle of the bill. Wings rather short, pointed, the first quill-feather the longest. Tail of sixteen feathers, moderately long, rounded. Legs short, placed far back ; tarsi scutellate in front ; hind toe small, slender, broadly lobed ; interdigital membranes full.

THE GOLDEN-EYE is another species of Duck, which visits this country in small flocks every winter, and is well known on most parts of our coast, particularly the females and young birds of the year, which are much more numerous

* *Anas Glaucion*, Linnæus, Syst. Nat. Ed. 12, i. p. 201 (1766)

† Isis, 1822, p. 564.

and more easily procured than adult males. Not only do they resort to and feed in the estuaries of rivers that fall into the sea, but they are also regular visitors to inland lakes and meres. If five or six of these Ducks are together, they do not all dive at the same time, but some of them remain on the surface as sentinels, keeping a good look-out to prevent being surprised by an enemy. They are active in the water, swimming and diving with great rapidity when in pursuit of their food, which consists mainly of small fishes, crustaceans, and mollusks. The flesh of this species, like that of other Ducks feeding on such substances, is not in much estimation. Young birds are better than old ones, but the muscular parts are dark and coarse in appearance and flavour.

The Golden-eye is a regular winter visitor to suitable localities in England, Ireland, and Scotland, inclusive of the Orkneys and the Shetlands. Birds have been observed as late as the end of May, and it has been asserted that the nest has been found in a hollow tree on the shores of Loch Assynt, Sutherlandshire, although the statement requires a confirmation which it has not yet received.

This species is only of rare occurrence in the Færoes; and in Iceland and Greenland it appears to be replaced by Barrow's Golden-eye, *C. islandica*.* In Scandinavia it is common in summer, and the following notes were supplied to the Author by the late Richard Dann:—"The Golden-eye is numerously spread over the whole of Lapland, as far as the wooded districts extend, both to the western range of mountains which separates Norway from Sweden, as well as the eastern parts. It breeds in small numbers on the coast of Norway, but not from Stavanger northward, and on the Dovre Fjeld Mountains.* It prefers rivers to lakes, particularly the neighbourhood of falls and rapids. The Laps and settlers place boxes, with an entrance-hole, in the trees on the banks of the rivers and lakes in which the Golden-eye lays its eggs. Although the birds are always robbed of their eggs, they gain nothing by experience, but seem to have such a predilection for holes in trees that if such cavities are to be found, artificial or natural, they always appear to prefer them to any other locality. The Golden-eye seems never to be driven from the north except by the waters freezing up. During the long and dreadful winter of 1837, the Golden-eyes did not altogether migrate; in the streams at Trolhattan, under the falls, and at various rapids and open parts of the rivers, they were, in considerable numbers, all the winter, in company with the Goosander, while all the Ducks, Mallards, and Wigeons were starved to death and found dead upon the ice. There have been speculations and opinions as to the mode the Golden-eye adopts to carry its young down from the holes of the trees in which they are hatched, which are frequently twelve or fifteen feet from the ground, and at some distance from the water. That the bird does transport them is beyond doubt. There is, I believe, but one person who has ever actually witnessed the manner: Nilsson was not aware of it. The Laps, whom I frequently interrogated, were also ignorant, beyond the mere fact of the bird carrying them. The clergyman, however, at Quickiock, in Lulean Lapmark, near the source of that chain of vast lakes whence the Lulean river flows, was once a witness. Contrary to the general character of the Lap clergymen in Lapland, this gentleman, with little to employ him, took a great interest in natural history and botany. While botanizing by the side of the lake near Quickiock, where Golden-eyes breed in great numbers, he saw a Golden-eye drop into the water, and at the same instant a young one appeared; after watching some time, and seeing the bird fly backwards and forwards from the nest five times, he was enabled to make out that the young bird was held under the bill, but supported by the neck of the parent.''

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* The late David Graham, of York, under date of 13th February, 1864, wrote that "a female specimen of Barrow's Golden-eye, shot at the mouth of the Derwent, had recently been sent to him for preservation." Some further, and remarkable, statements regarding this species will be found, by those curious upon the subject, in 'The Zoologist,' pp. 9038, 9122; the then Editor of that periodical accepting the main assertion without question! The best and most recent American authorities say that they can lay down no rule for distinguishing between the females of the two species; but on the average the female of Barrow's Golden-eye is the larger, and the young male 'Barrow' may be recognized by his superior size, higher bill, and smaller expanse of white on the wings. The adult male 'Barrow' is larger than the male Golden-eye; the head is more crested, and the gloss on it is purplish.

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* [Its breeding-range is now known to be more extensive: Mr. A. C. Chapman found its nest near Pulmak in Finland, nearly at the 70th parallel, where the trees were hardly large enough to provide a hole for its occupation.—Ed.]

The Golden-eye is said to nest irregularly in Holstein, Mark Brandenberg, and some parts of north-eastern Germany; becoming more plentiful in the Baltic Provinces, and a regular and numerous breeding species in Russia down to about 58° N. lat. Over temperate Europe it occurs on migration, both on the inland waters and along the coast; but it is comparatively rare in the western portion of the Mediterranean, except in severe winters, and very uncommon on the coast of North Africa. In the Ionian Islands, the Black Sea, and on the northern shores of Asia Minor, it is not unfrequent during the cold season; and eastward it is found on the Caspian; in Afghanistan; on the elevated lakes of the Pamir, Kashgaria, and Mongolia (up to 10,000 feet); and across Northern Siberia to the Pacific. It remains in the north as long as it can find open water, visiting on migration Japan, and China as far south as Amoy; in India it has been obtained in Sind, and once near Lucknow.

Throughout North America—breeding from the State of Maine northwards, and migrating as far south as Cuba in winter—is found a race which, according to the American naturalists, is constantly and considerably larger than our bird, and which they distinguish by the name of *Clangula glaucion americana*. They are unable to detect any difference in coloration.

As already stated, the Golden-eye makes its nest in a hollow of a tree, or in the boxes provided by the natives, called 'holkar' by the Swedes and 'pönttö' by the Finns. Messrs. Hewitson and Hancock, when in Norway, examined a nest in a tree, in a hole lately occupied by a Woodpecker, at the height of ten or twelve feet from the ground; but though the aperture inside was about a foot in diameter, and lined with the soft down of the bird, the external opening was so small that it was with difficulty the hand could be inserted. The eggs laid by the same female are said to vary in number according to the age of the bird, the old ones laying fewer, but finer and larger eggs, than the younger ones; but where more than ten or twelve are found in the same nest—and up to nineteen are recorded by Mr. Dresser—it may reasonably be supposed that another female contributed. The colour when fresh is often a very bright green or bluish-green; average measurements of the egg, 2·4 by 1·6 in.

The Ornithological Society of London retained a female Golden-eye on the lake in St. James's Park for two years, where she associated constantly with a male Smew; and in 'Isis,' 1829, p. 400, Mr. Eimbeck describes an apparent hybrid between a male Golden-eye and a female Smew. Although kept in the Zoological Gardens since 1832, Golden-eyes have not been known to breed there, either *inter se* or with other species. G. St. Hilaire has described the hybrid offspring resulting from the union of the Golden-eye and the American Wood Duck.

Sir R. Payne-Gallwey says that Golden-eyes are always wary birds, seldom paddling away from a punt, but rising at a long distance when pursued. They do not swim low and buried, like Scaup and Pochard, on any occasion, except when wounded; and they frequently, especially in windy weather, fly restlessly to and fro. The wings being short and stiff in proportion to the weight and size of the bird, are beaten so quickly as to produce a distinct whistling sound, whence the names of 'Rattle-wing' and 'Whistler.' On rising from a dive, the Golden-eye seems to have the power of taking wing with the impetus of the upward movement, without tarrying a few seconds on the surface of the water to recover breath.

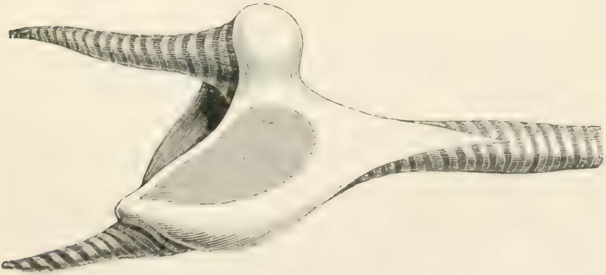
The adult male in winter and spring has the bill bluish-black; the irides golden-yellow; at the base of the upper mandible a roundish white patch; head, and sides of the neck, rich glossy green, the feathers on the occiput a little elongated; chin and throat black; lower part of the neck all round white; middle line of the back and the rump bluish-black; tail-feathers greyish-black; point of wing black; both sets of wing-coverts black at the base, white at the end; primaries and inner secondaries black; the rest of the secondaries and the scapulars white, the latter edged with black; breast, belly, and under tail-coverts white; flanks and thighs dull greyish-black; legs and toes yellow, the connecting membranes black. In summer, after the female has begun to sit, the male assumes a plumage very similar to hers, but there is generally a little white showing at the base of the bill, and the wing-coverts remain white. The whole length nineteen inches; from the carpal joint to the end of the wing nine inches.

The female is smaller than the male, and has the bill brownish-black at the base, orange-brown towards the point; the head, and upper part of the neck all round, hair-brown, below this a broad collar of white; lower part of neck, back, rump, and tail-feathers greyish-black, edged with bluish-grey; smaller wing-coverts edged with white; secondaries and greater coverts white; primaries dusky; breast and belly greyish-white; sides, flanks, and under tail-coverts mottled with greyish-black; legs, toes, and their membranes as in the males.

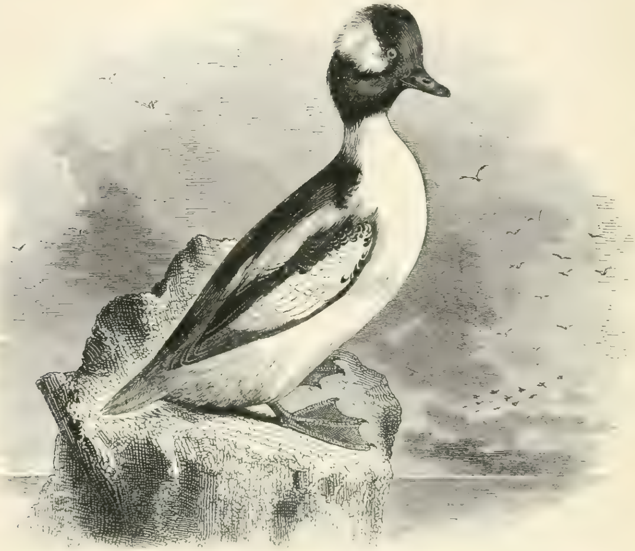
Young birds, for the first few months, resemble the female, but young males beginning to assume their proper colours, have the brown of the head darker; the occipital feathers slightly elongated, causing the head to appear bushy and large; the white colour on the wings occupies more surface, and being purer in its tint, is more conspicuous; the scapulars exhibit some white lines; the back is darker, almost black; and the male is altogether larger in size. In this state it has been called the Morillon, and was considered, for a time, a species distinct from the Golden-eye, but repeated examinations of the internal parts, particularly the organ of voice, have proved it to be the young. Young males show the commencement of the white patch at the base of the upper mandible by the end of December, by which time the head and neck show a great deal of dark green.

The downy nestling is deep sooty-brown on the upper half of the head, hind neck, and rest of upper parts; a few white markings near the junction of the pinions, and a spot of white on the rump behind each thigh; chin and throat pure white, followed by a dusky-brown collar; under parts greyish-white, mottled with brown on the flanks.

The trachea of this species is singular in its form, differing from the character of those of the Ducks in general, and bearing some resemblance to those of the Mergansers, both in the tube and in the labyrinth. The length is about nine inches, the diameter of the upper half of the tube equal in size, and small; at the commencement of the second half, the tube is dilated to four times the previous size, and the rings are so arranged as to lie flat upon each other. The last, or fourth, portion again contracts till it ends in the labyrinth, of which the vignette below represents the surface nearest the back of the bird. The bronchial tubes are observed to be unequal in length, to compensate for the obliquity of the inferior surface of the labyrinth, which, as usual, is made up partly of bone and partly of membrane. The voice is said to be very loud: whence, or from the noise of the flight, the name *clangula*.



ANSERES. *ANATIDÆ.*



CLANGULA ALBEOLA (Linnæus*).

BUFFEL-HEADED DUCK.

Fuligula albeola.

THIS American species was included by Donovan in his 'British Birds' (vol. 10, pl. 226), concluded in 1819, but without mention of the authority on which it was given, or any record of the place of capture. In the winter of 1830, or about that time, a male was shot near Yarmouth, in Norfolk, which passed into the possession of the late Mr. Stephen Miller, and subsequently into that of Mr. Rising, of Horsey. In the autumn of 1841 the then curator of the Museum of Natural History at Margate sent word to the Author that during a recent visit to Orkney, he had there obtained a Buffel-headed Duck, which was intended for the Margate Museum : a statement true in a way, for he had bought it of the late R. Dunn, of Stromness, whose son informed Mr. J. H. Gurney, jun., that the specimen was not procured in Britain, or even in Europe ! In the collection of the Rev. W. Hore, of Barnstaple, is a specimen said to have been shot near Devonport in 1841, but Mr. Gatcombe informs the Editor that it came from the late Dr. Tripe of Devonport, whose collection contained several American birds, and a mistake is therefore not impossible. In the 'British' collection in the Natural History Museum, is a specimen cited by J. E. Gray as "Norfolk : from Mr. Hubbard's collection," without further details. Mr. Robert Gray says, in his 'Birds of the West of Scotland' (p. 396), "Mr. Angus showed me a beautiful male which was shot on the Loch of Loriston, Aberdeenshire, in January 1865 ; and Mr. Edward of Banff showed me a specimen—also a male—shot many years ago in the Loch of Strathbeg, and placed in the Banff Museum by the late Mr. Smith, minister of Monquhitter." Lastly, a mature male, shot in the winter of 1864–65 near Bridlington, Yorkshire (Zool. p. 9659), is now in the collection of Mr. J. Whitaker of Rainworth.

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* *Anas Albeola*, Linnæus, Syst. Nat. Ed. 12. i. p. 199 (1766).

There do not appear to be any authentic records of the occurrence of the Buffel-headed Duck on the coasts of the Continent. In Greenland, according to Reinhardt, a female example was obtained at Godthaab about 1830. This species has long been well known to the naturalists of North America. Audubon says that "during autumn and winter it is to be seen in almost every part of the Union, frequenting the sea-shore, rivers, and lakes. It feeds on shell-fish, shrimps, and marine plants, particularly the species of laver named *Ulva lactuca*, and the bird being generally very fat, one of its common names is 'Butterbox' [or 'Butter-ball'] ; it is also called 'Spirit Duck,' and 'Conjuror,' from the facility with which it escapes by diving suddenly at the flash of a gun, or the twang of a bowstring. The Buffel-headed Duck is a very hardy bird, for it remains during extremely cold weather on the Ohio, when the river is thickly covered with floating ice, among which it is seen diving almost constantly in search of food. When the river is frozen over they seek the head waters of the rapid streams, in the turbulent eddies of which they find abundance of prey. Possessed of a feeling of security arising from the rapidity with which they can dive, they often allow you to go quite near them, though they will then watch every motion, and at the snap of your gun, or on its being discharged, disappear with the swiftness of thought, and, perhaps, as quickly rise again within a few yards, as if to ascertain the cause of their alarm. When these birds return to us from the north, the number of the young so much exceeds that of the old, that to find males in full plumage is much more uncommon than toward the time of their departure, when I have thought the males as numerous as the females. Although at times they are very fat, their flesh is fishy and disagreeable ; many of them, however, are offered for sale in our markets. The note is a mere croak, much resembling that of the Golden-eye, but not so loud." The migrations of this species extend to the Bermudas, Texas, Mexico and Cuba.

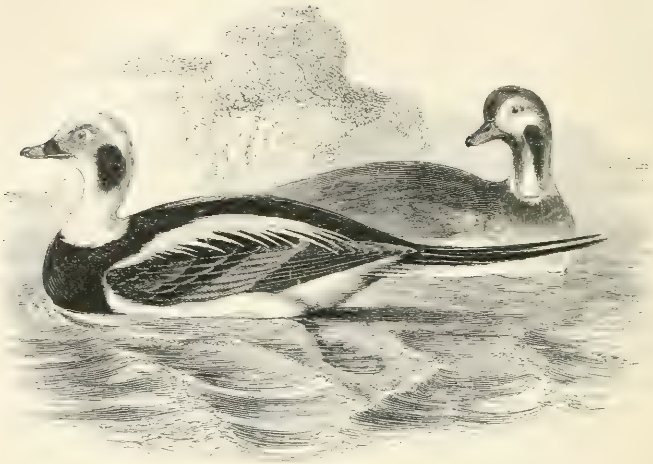
The breeding-range of the Buffel-headed Duck extends throughout the Fur Countries and the northern portions of America, from the Atlantic to the Pacific, as far south as the State of Maine. So far as is at present known, the nest is, like that of the previous species, placed in the hollow of a tree, and lined with down. One found by Mr. Lockhart on the Yukon river was in the hollow of a poplar-tree, about twenty feet from the ground, and on the 7th of July contained ten eggs ; their colour was of an ivory-white with a faint tinge of green ; measurements 2 by 1·5 in. Mr. A. C. Stark describes a nest from which he shot the bird, on the 27th of May, 1882, in West Minnesota, as situated in a hole of an oak-tree, the hollow being only a few inches deep and partly filled with decayed wood, on which lay eight eggs nearly buried in down. The stomach of the Duck was crammed with small red worms.

In the adult male the bill is bluish-black, narrow, and small; irides hazel; forehead, lore, chin, throat, and sides of the neck, bluish-black, tinged with rich purple and green; behind the eye, on the ear-coverts, and thence upwards to the crown of the head, and backwards to the occiput, a triangular patch of pure white; the feathers of the head elongated, forming a crest which is elevated at pleasure; lower part of the neck white; back, rump, and inner secondaries black; other secondaries, scapulars, and wing-coverts white; primaries greyish-black; tail-coverts and tail-feathers pale ash-grey; breast, belly, and all the under surface of the body white; legs, toes, and membranes yellow. Whole length fifteen inches. From the carpal joint to the end of the longest quill-feather six inches and three-quarters.

The female is smaller than the male; the head and neck ash-brown, with a patch of white behind the eye; upper part of the back greyish-brown, lower part black; wing-coverts, primaries, and inner secondaries dark greyish-brown; outer secondaries white; tail ash-grey; breast and belly dull white; vent and under tail-coverts greyish-white; legs and toes bluish-black; whole length thirteen inches; wing six inches and one-quarter. Young males in the first autumn resemble females.

The trachea, described by Audubon, "is five inches long, much flattened, its rings unossified, its diameter at the top two lines and three-quarters, towards the lower part three lines, having scarcely any appearance of dilatation at the part which is so excessively enlarged in the Golden-eyed Duck, which, in form and habits, is yet very closely allied."

The specimens from which the figure and descriptions here given were derived, were obligingly lent to the Author for use in this work by Mr. Joseph Clarke of Saffron Walden.



HARELDA GLACIALIS (Linnæus*).

THE LONG-TAILED DUCK.

Fuligula glacialis.

HARELDA, *Stephens*†.—Bill much shorter than the head, its outlines tapering rapidly to the tip, which is occupied by the broad, prominently decurved nail; lamellæ slightly exposed along the gape-line; nostrils oblong, sub-basal. Feathering at the base of the bill forming an oblique line, advancing furthest forward on the forehead, and scarcely interrupted by the re-entrant angle so prominent in most Ducks. Wings rather short, pointed; scapulars much elongated and lanceolate in the adult male. Tail of fourteen feathers, short and graduated, the two central feathers in the adult male very long and tapering. Legs short, placed far back; hind toe small, but broadly lobed.

THIS species, remarkable for the great diversity in the appearance of its plumage, depending on age, sex, or the season of the year, is an autumn and winter visitor to the British shores. The appearance of the Long-tailed Duck in the south and south-west of England is uncommon and

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[*] *Anas glacialis,* Linnæus, Syst. Nat. Ed. 12, i. p. 203 (1766).

[†] Shaw's Gen. Zool. xii. pt. ii. p. 175 (1824).

indicative of severe weather in the north; and the examples obtained are, for the most part, young birds of the previous season. In Cornwall it is extremely rare; somewhat less so in South Devon; and specimens have been killed on the coasts of Dorset, Hampshire, Sussex, Kent, Essex, Suffolk, and Norfolk. In the two latter, adult males have occasionally been observed and obtained; but they may be considered as very rare to the south of Flamborough Head, in Yorkshire; although young birds are not uncommon along the east coast from Norfolk northwards. Long-tailed Ducks are most frequently found in sheltered bays or estuaries; but they are occasionally taken on inland waters, and Mr. W. Borrer sent the Author notice of an adult male killed in Huntingdonshire in January 1838. On the coasts of Wales and the north-west of England this species is of irregular occurrence.

In Scotland the Long-tailed Duck is described by Mr. R. Gray as a familiar winter visitor, being distributed in small flocks off shore from Berwickshire to Caithness; and on the west side it is very common in the Outer and Inner Hebrides, although of uncertain occurrence south of the latter. In the Orkneys and Shetlands, where small flocks arrive early in October, remaining till April, this species is to be met with on all the inlets or voes; and, from the loud musical note of the male, it is well known by the name of 'Calloo.' Although proof is wanting, the Editor has little doubt that it breeds on some of the unfrequented lochs of Yell, and he observed it in Sommervoe in July 1879. On the south coast of Ireland it is rarely seen, but on the west it is less scarce, and in the north its appearance, although irregular, is not unfrequent.

It seems probable that a few pairs remain to nest in the Færoes; and in Iceland it breeds in considerable numbers. The notes of the late Mr. Richard Dann, in reference to this species in Scandinavia, are as follows:—"The Long-tailed Ducks are very numerous on the coasts of Norway and Sweden during the winter, but are seen in greatest numbers off the coast of Scona. Towards the middle of March they begin to draw north, and by the latter end of May appear in vast numbers on the streams and lakes in the mountain-range which divides Finmark from Swedish Lapland. As the season advances they take themselves to the more elevated and smaller lakes, but in Lapland are not generally found within the range of the dwarf-birch. In the Dovre Fjeld, a few straggling pairs make their appearance and breed. They arrived the last week in May, on the lakes and swamps within the range of the birch, and continued to increase in numbers until the 14th of June, when I lost sight of them on the lakes where they had been most abundant. On ascending, however, to the small lakes in the valleys still higher up the mountains, and at an elevation where the creeping-birch and dwarf-willow can only vegetate, I again found them in pairs the last week in June; the ice had not then entirely disappeared on these lakes. In July, I again lost sight of the females, but frequently found, and shot the males in the most elevated lakes and small pools in the snow mountains. Those I shot were filled with the larvæ of aquatic insects." The Long-tailed Duck breeds, but is apparently of very local distribution, in Spitsbergen; in Novaya Zemlya, however, it is abundant; and in Russia it breeds throughout the northern districts, and in some parts of the Ural. In winter it is numerous in the Baltic; its migrations extending to the coasts of Denmark, Holland, Belgium, France, and occasionally to the inland waters of Central Europe. From time to time examples have been obtained at the mouth of the Rhone; along the Riviera; on the Italian lakes; and in the province of Venetia; but its occurrence on the southern and eastern shores of the Mediterranean has not yet been recorded.

In Asia the Long-tailed Duck breeds throughout the northern portions of Siberia; and it appears to pass the winter from Lake Baikal southward to Northern China and Japan. In North America it is abundant in the Aleutian Islands, Alaska, and the whole of the Arctic regions as far as Greenland; migrating to the coast of California on the west, and to the Chesapeake on the east, where it is known by the names of 'South-southerly,' and 'Old Squaw,' from its gabbling note.

The nest of the Long-tailed Duck is generally placed among low bushes by the edge of fresh water, and is composed of a few stems of grass with a thick lining of down, little inferior to that of the Eider. The eggs, of a somewhat elongated oval form, are of a pale greenish-grey, and measure about 2·1 by 1·45 in. On a small flat island in Lake My-vatn, Iceland, Messrs. Shepherd and Upcher counted more than twenty nests, and observed a Long-tailed Duck and a Scaup sitting together on one which contained several eggs of the two species.

The food of this Duck consists of small mollusks, crustaceans, fish, marine insects, and fresh-water insects in summer; its flesh is coarse, hard, and fishy. Mr. Seebohm says that this bird is decidedly of a quarrelsome disposition, and he frequently saw it fighting with its fellows, both on the wing and on the water. The loud and peculiar note of the male has already been mentioned.

The adult male in winter, and spring nuptial plumage, has the nail, and the basal half of the bill black, the intermediate portion pale rose-colour when fresh, drying in a few hours to a reddish-brown; the irides varying from yellow to hazel and red; the cheeks and ear-coverts, including the space round the eye, brownish-buff; below this on each side of the neck an oval patch of dark brown, inclining to chestnut-brown at the lower margin; forehead, top of the head, back, and front of the neck, and the lower part of the neck all round, below the dark brown patch, pure white; the middle line of the back, the rump, and elongated tail-feathers nearly black; scapulars, inner secondaries, and short outside tail-feathers white; wing-coverts and primaries dark brownish-black; the secondaries reddish-brown; the whole of the breast black; belly, sides, flanks, vent, and under tail-coverts white; legs and toes pale bluish-lead colour, the webs almost black. The whole length, without including the elongated tail-feathers, which are sometimes nine inches long, is seventeen inches: to the end of the long tail-feathers twenty-two to twenty-four inches; from the carpal joint of the wing to end of the longest primary nine inches; the first and second quill-feathers nearly equal and the longest in the wing.

The winter plumage is generally perfected by the middle of October: the summer plumage is assumed by the end of May, and at that time only the space around the eye is pale buff, mixed with a little white; all the other parts of the head, neck, back, wings, and breast black; the scapulars and tertials black, each feather with a broad edge of rufous-brown; belly, and under surface of the body white, as in winter; bill, irides, and legs the same.

A male killed while intermediate, or in change with reference to the two states of plumage described, had the forehead black; top of the head and the occiput white; cheeks brownish-buff; all the neck mottled with black and white; scapulars and inner secondaries white at the base, black in the centre, and reddish-brown on the margin; secondaries distinguished from the coverts and primaries by their lighter reddish-brown colour.

Females have the forehead, crown, and back of the neck, dark brown; the lore, or space between the base of the bill and the eye, the ear-coverts, and sides of the neck greyish-white; below the ear-coverts, on both sides, a patch of brown; all the back and wings dark brown; primaries and tail-feathers almost black; neck, in front, light brown, clouded with darker brown; breast, belly, and under tail-coverts white; thighs and flanks pale ash-brown. Females measure about sixteen inches in length, and do not assume the white scapulars or the elongated tail-feathers.

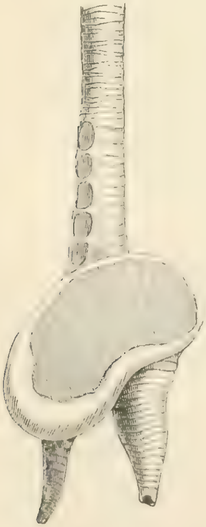
Young birds for the first twelve months resemble the females. Young males in their first winter may be distinguished from young females by being a little larger in size, and in having the brown and the white parts about the head and neck rather more pure in colour, and their limits better defined.

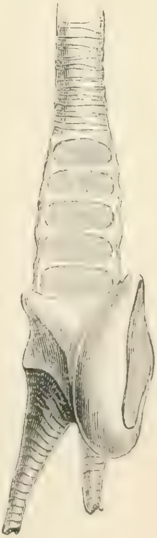
The Author was indebted to the late Mr. Richard Dann for the use of a beautiful series of examples of this species, from which the various descriptions here given were derived.

The Author saw in 1845, in the collection of the late Mr. Hadgraft, a perfectly white example of this species, brought from North America.

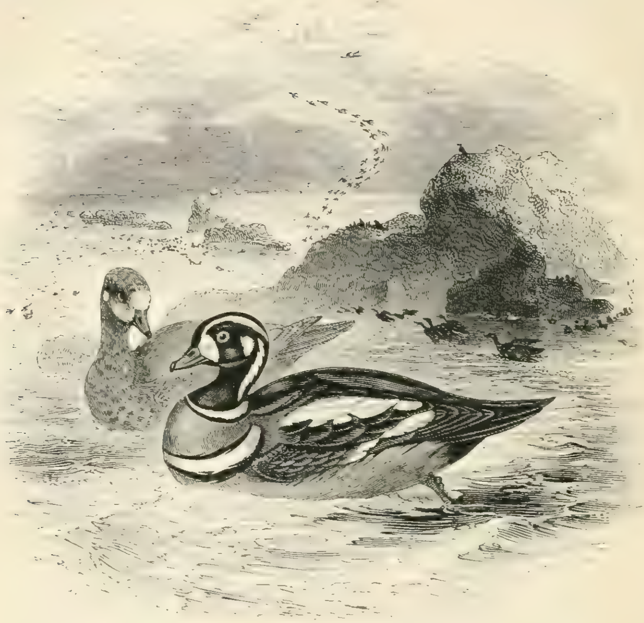
A nestling in the collection of Mr. Bidwell, obtained by Mr. Harvie-Brown on the Petchora, is of a very dark brown above, with a small light patch at the base of the bill on each side, and another round each eye; under parts greyish-white, with a small brownish collar; bill very broad and short.

The trachea of the male is about seven inches in length, and very singular in its structure. At the bottom of the tube five window-like apertures, as well as the kidney-shaped tympanum, are closed by a delicate membrane. The vignette exhibits this curious structure in two points of view. The windpipe of the female is of the common or ordinary form.





ANSERES. *ANATIDÆ.*



COSMONETTA HISTRIONICA (Linnæus[*]).

THE HARLEQUIN DUCK.

Fuligula histrionica.

COSMONETTA, *Kaup*[†].—Bill rather short, converging rapidly to the tip, which is occupied by a large decurved nail; a small lobe on each side at the base of the upper mandible; lamellæ concealed; nostrils oblong, median. Wing short, pointed, the first and second quill-feathers nearly equal in length. Tail of fourteen rather pointed feathers, much graduated. Legs short, and placed far back; hind toe slender, with a large lobe; anterior toes fully webbed.

THIS handsome species, called the Harlequin, from the variety of the colours and markings in the male, is one of the rarest of stragglers to our coasts. Its occurrence in the British Islands was first recorded by James Sowerby, who gave coloured illustrations of an adult male and a female in his 'British Miscellany,' pl. 6, p. 11 (1806), stating that the specimens had been presented to him by his "kind friend Lord Seaforth, who procured them from Scotland." Montagu subsequently described these two birds in his 'Ornithological Dictionary' (1813). Sowerby adds, "Mr. Simmons gave me a young female which he shot in one of the Orkneys." Whether the two former birds were really killed in Scotland; or whether the latter was really a female Harlequin and not a young Long-tailed Duck, it is now impossible to say; but it may be briefly remarked, that all the young or female 'Harlequins' which have from time to time been recorded, have been proved, where proof was possible, to be Long-tailed Ducks. Those desirous of details may consult Prof. Newton's remarks in 'The Ibis,' 1859, pp. 162–166, and also an exhaustive criticism by Mr. J. H. Gurney, jun., in his 'Rambles of a Naturalist,' pp. 263–269. Even examples which have been recorded as males in adult plumage, have proved to be examples of the American Wood Duck or some other species. This was undoubtedly the case with those which Mr. J. J. Briggs described as having bred, in captivity, at Melbourne in Derbyshire: a statement unfortunately accepted and published in the 3rd Edition by the Author, whose acquaintance with the Harlequin Duck was limited. Major W. Ross King states that he shot a male in good plumage in 1858, at Buchan in Aberdeenshire, after several days' storm from the north-east; but, although stuffed at the time, the bird was subsequently thrown away. The only authentic example known to the Editor is a male in the collection of Mr. J. Whitaker, of Rainworth, which was rescued by Mr. Roberts, of Scarborough, from some fishermen who had found it dead on the shore at Filey, and were throwing it into the water for a dog to retrieve, in the autumn of 1862.

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[*] *Anas histrionica* (male, No. 35), *A. minuta* (female, No. 36): Linnæus, Syst. Nat. Ed. 12, i. p. 204 (1766).

[†] *Cosmonessa* (p. 46), *Cosmonetta* (p. 196), Kaup, Natürl. System (1829). There is no other member of this well-marked genus.

There are no authenticated instances of the occurrence of the Harlequin Duck on any part of the Continent: but there is a male in the Upsala collection, supposed to have been obtained somewhere on the Swedish coast, and a male in the Bamberg Museum, said to have been shot in Tyrol in 1852. If the notes of Mr. Henke, published by Mr. Seebohm, are to be received implicitly, then "the Harlequin Duck is a rare summer visitor" to the neighbourhood of Archangel (Ibis, 1882, p. 384); but there is no confirmatory evidence of this, or of the old statement that this Duck is found on the Caspian and the Aral. It has not been observed on Novaya Zemlya, nor at the mouth of the Petchora; Dr. Finsch did not meet with it on the Ob, nor Mr. Seebohm on the Yenesei. In the eastern half of Asiatic Siberia it is found on the waters of the mountains and highlands, from Lake Baikal and the Amoor to Kamtschatka, the Stanowoi Mountains, and the Sea of Okhotsk; thence, by way of the Kuril Islands, we trace it to northern Japan in winter. Crossing Bering Sea, it occurs sparingly in the breeding-season, in suitable localities, in Alaska, California down to the upper waters of the Stanislaus at about 4000 feet elevation, the Fur Countries up to the Arctic Circle, and the interior of Labrador, and Newfoundland; migrating as far south as the Middle States in winter. In Greenland it has been observed on both coasts: principally between 62° and 65° N. lat.

Iceland is the nearest point to the British Islands where the Harlequin Duck is to be found; and there it appears to be resident, migrating from the northern to the southern districts in the winter. Mr. Shepherd observed it in considerable numbers in the north-west portion, frequenting the Laxà and other rapid streams, and making its nest in holes in the banks; and Dr. Kruper states that near Myvatn it always selects holes in the lava, or under stones; the eggs being buried in a whitish down. In Newfoundland, Dr. C. Hart Merriam was assured by Mr. J. P. Howley and other authorities that the Harlequins, which are there called 'Lords,' and 'Ladies,' made their nests in hollow trees, like the Wood Duck. The eggs are of a creamy buff-colour; average measurements 2·2 by 1·7 in.

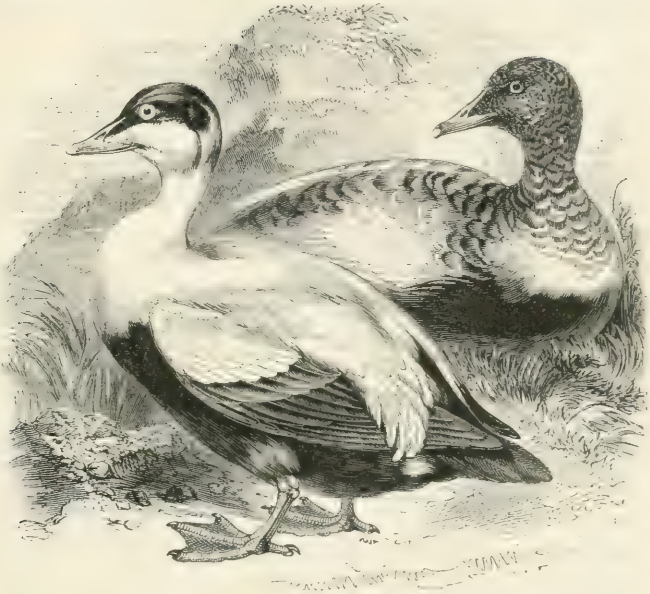
The food of the Harlequin consists principally of small mollusks, crustaceans and marine insects, in winter; and in summer Mr. L. Belding found the crop and gizzard of one he dissected full of insects, partly the caddis-fly, without any remains of fish, although the bird was shot in a trout stream. He also states that "these birds, young and old, tumble over and through rapids and cascades in an astonishing manner." It is said to be a remarkably silent Duck.

The adult male has the bill bluish-black; the irides orange; from the centre of the base of the bill over the crown to the occiput, a black streak margined at first with white and afterwards with chestnut on each side; behind each eye a patch of white, followed, lower down, by a broader streak of white; at the base of the bill on each side of the black streak, a broad patch of white; rest of the head, throat, and neck bluish-black, down to an imperfect collar of white margined with black; lower down, in a line with the carpal joint, a crescentic half-band of broader white edged with black; back, wing-coverts, and rump, bluish-black; primary quill-feathers and tail dull black; scapulars and secondaries white; front of neck between the crescentic bands bluish-grey; below the second band dusky-grey, becoming darker towards the vent and under tail-coverts, which are bluish-black; sides of the body and flanks chestnut; legs and toes blue, the membranes darker. Whole length seventeen inches; wing, from the bend, eight inches.

The female is considerably smaller than the male, and of a nearly uniform brown-colour above, but mottled on the front of the neck and on the breast with two shades of brown, and with a patch of more or less pure white on the forehead, as well as before and behind the eye; the belly whitish. The whole length is fourteen inches; wing, from the carpal joint, seven inches.

Young males during their first winter are like the females, but, in the second year, according to Audubon, "are greyish-brown on the back and wings, light brownish-grey beneath. The head and neck are of a dull leaden-blue, the upper part of the head darker. The white spot before the eye is mottled with grey, the line extending over the eye obscure, and the edging of the occiput faint reddish-brown. The two white marks exist on the sides of the neck, but are merely edged with darker blue; there are slight indications of the white collar, and the band before the wing is marked, but much smaller than in the adult. The quills are dark brown, but the secondaries are not tipped with white, of which there are but slight indications on the scapulars. The upper tail-coverts are blackish, the tail bluish-grey, lighter at the end. The bill is dusky; the feet of a leaden tint. The male in the third year, and after his second moult, has greatly improved in colouring, although the tints are not nearly so pure as in the old bird. The hind part of the neck is still brown, as are the wing-coverts; the sides are dark brownish-grey, with undulated yellowish-red bars. The white collar is not yet complete, but all the white markings on the neck are edged with black; the fore part of the breast is dull grey, the middle yellowish-grey, spotted with bluish-grey. The white bar on the wing is still wanting; the rump is glossy bluish-black, the tail nearly of the same tint."

The Author was never able to obtain a specimen of the windpipe of the male of this species, which is thus described by Audubon:—"it is six inches and a half in length, has at first a breadth of only three lines, but at the distance of three-quarters of an inch, enlarges to four and a half lines, and so continues for two inches; it then contracts to two and a half lines, and again at the lower part enlarges to five and a quarter lines, and terminates in a large transverse bony dilatation or tympanum, of which the length is seven and a half lines, the breadth one inch two lines; it projects as usual to the left side, where it is of a rounded form." Illustrations of the windpipes of both male and female birds are to be found in Prof. Newton's paper already mentioned (Ibis, 1859, p. 162).



SOMATERIA MOLLISSIMA (Linnæus*).

THE EIDER DUCK.

Somateria mollissima.

SOMATERIA, *Boie* †.—Bill swollen and elevated at the base ; extending up on the forehead, where it is divided by an elongated, descending, angular projection of feathers down the surface. Nostrils lateral, oval, small. Legs short ; feet of three anterior toes, broadly webbed ; hind toe with a deeply-lobated membrane. Wings of moderate length, with the first and second quill-feathers sub-equal. Tail short, of fourteen feathers.

THE EIDER DUCK, though indigenous to some of the northern parts of England, as well as several of the Scottish Islands, is only a winter visitor to the southern portions of the kingdom. At long intervals it has been obtained on the coasts of Cornwall, Devon, Dorset, and Hampshire ; more frequently off Sussex and Kent ; while along the east coast

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[*] *Anas mollissima*, Linnæus, Syst. Nat. Ed. 12. i. p. 198 (1766).

[†] Isis, 1822, p. 564.

it gradually becomes commoner to the northwards; the examples observed being principally birds of the year. In Northumberland—the only English county in which it breeds—the Eider Duck used to nest on Coquet Island, near Warkworth: a locality abandoned for many years owing to molestation, but the Editor believes that it is again resorted to by a few pairs. On the Farne Islands, a little further north, it has been well known as a breeding species for centuries, and from the circumstance of its nesting on an islet once the abode of St. Cuthbert, as well as on Holy Island or Lindisfarne, equally associated with that celebrated Saint of the north-country, this species has been called St. Cuthbert's Duck. To the west side of England the Eider is only an irregular winter visitant.

In Scotland the Eider Duck breeds on the shores and islands of the Firth of Forth; and, probably, where suitable localities present themselves, along the whole east coast; as it certainly does in the Orkneys, and the Shetlands. In Sutherlandshire, it is of sparing and local distribution during the breeding-season; and Sir John Campbell-Orde informs the Editor that in North Uist and the neighbouring islands of the Outer Hebrides there is only one locality in which a number of birds nest in proximity. About Colonsay and Islay it is very abundant, but it does not appear to breed on the mainland of Argyll, Ayr, or Wigton. It is somewhat remarkable that the Eider should be a very rare visitor to the Irish coast; one in Belfast Bay, two or three at the estuary of the Moy, two in Tralee Bay, one in Cork Harbour, and one in Wexford, being all the examples recorded by Sir R. Payne-Gallwey.

The Eider Duck occurs irregularly in winter on the coasts of Northern Germany, the Netherlands, and France; and stragglers have been obtained on the inland waters of the Continent, as well as in the Mediterranean as far east as the head of the Adriatic. Its home must, however, be sought for in the north. It breeds in the Færoes, Iceland, and Norway, where it is protected by law; and northwards it can be traced to Spitsbergen (where birds are on the average smaller), and Franz-Josef Land. It nests in Novaya Zemlya, but eastward it seems doubtful if its range extends beyond Cape Chelyuskin, for Pallas's statement that it is found at the mouth of the Lena and in Kamtschatka is unconfirmed, and it is possible that he may have mistaken for it a larger and distinct species, *Somateria v.-nigrum*, the male of which has a black chevron under the chin. Our Eider is found in Greenland, as far north as Thank-God Harbour, in 81° 38′ N. lat., and westward to the mouth of the Coppermine River in Arctic America; but on the North Atlantic coast, from Labrador to the Gulf of St. Lawrence, it is replaced in summer by *S. dresseri*, in which the bill is more gibbous, the bare space behind the nostril more extensive, and the sickle-shaped secondaries are more developed. This form will probably be exterminated by the Indians and fishermen at no distant date.

The breeding of the Eider Duck under the protection afforded to it in Northern Europe for the sake of its valuable down has often been described. Hewitson mentions the Eiders as the most numerous of the Ducks breeding on some of the islands on the west coast of Norway, where they are strictly preserved. Upon one island which his party visited with the keeper, the females were sitting in great numbers, and were so perfectly tame and on such familiar terms with the latter, that some of them would even allow him to stroke them on the back with his hand. The male birds at the time were floating about in hundreds among the islands, giving the sea a lively and beautiful appearance. A fuller, and more interesting account is given by Mr. C. H. Shepherd in his book on the North-west Peninsula of Iceland. Although the nest of the Eider is usually at no great distance from the water, it has occasionally been found a mile or two inland, and also at a considerable elevation. Major Feilden states that he has taken one in the Shetlands, placed in the midst of knee-deep heather, at least 500 ft. above sea-level; and Müller mentions having found one on the top of the island of Hestoe, at an altitude of 1000 to 1200 ft.

The following account of the breeding of the Eider at the Farne Islands is given by Selby:—"About April these birds are seen assembling in groups along the shores of the main land, from whence they cross over to the islands early in May. As soon as the females begin to lay, which is usually about the 20th, the drakes leave them, and again spread themselves along the adjoining coast. The usual number of eggs is five, of a pale asparagus green, and rather large, measuring three inches in length, by two inches and one line in breadth. The nest is composed of fine sea-weed, and as incubation proceeds, a lining of down, plucked by the bird from her own body, is added: this increases from day to day, and at last becomes so considerable in quantity, as to envelope and entirely conceal the eggs from view, no doubt contributing by its effect, as a nonconductor of heat, to the perfect evolution of the fœtus. Incubation lasts a month. The food of the Eider consists of the young of the different muscles that cover the rocks, and other species of bivalves. The young are reared with difficulty in confinement, and being very bad walkers, are subject to frequent accidents in the poultry-yard. Like all the *Anatidæ* possessing a lobated hind toe, they dive with facility, and remain submerged for a long time."

In Iceland each nest produces an average of one-sixth of a pound of down, which is worth from 12s. to 15s. per pound on the spot, and it requires about 1½ lb. to make a single coverlet. Most of the eggs are taken and pickled for winter consumption, only a few being left to hatch. Eider Ducks are easily domesticated, and not only will they feed freely on worms, slugs, &c., but they also devour voraciously the raw flesh of other birds. In the Zoological Gardens, broods were hatched out in 1841, 1848, and 1849.

In the adult male the beak is dusky-green; the nail white; the irides brown; top of the head velvet-black; lore and cheeks white; ear-coverts and occiput pale green; back, scapulars, tertials, point of wing, and smaller wing-coverts white; greater wing-coverts black; primaries and secondaries dull black; inner secondaries yellowish-white, elongated, drooping; rump black; tail-feathers dull black; chin and upper part of neck in front white; lower part of neck pale buff; breast, belly, sides, and all the under surface black, except a white patch on the flank; legs, toes, and their membranes dusky-green. The whole length is twenty-five inches; from the point of the wing to the end of the longest quill-feather eleven inches.

Young males of the Eider are at first like the adult female, but when changing in their first winter the head and neck are mottled with two shades of dark brown, with a few white feathers appearing through in different parts; lower portion of neck, and upper part of the back, mottled black and white; wing-coverts and inner secondaries becoming white; the rest of the plumage black; legs and bill greenish-grey. The pure white colour is assumed by slow degrees, and the appearance of adult birds is not attained till the third winter.

The female is a pale rufous-brown, varied with darker marks: similar to but less ruddy than the female of the King Duck hereafter figured; the quill and tail-feathers dull black.

The following notes in reference to the periodical changes of the plumage in old and young Eider Ducks, were supplied to the Author by James Hunt, then head-keeper at the Zoological Gardens in the Regent's Park:—

August 21st, 1845. An old male began to lose its white or breeding plumage about the 7th of June, and by the 20th of July it was almost black: a few white feathers being left on the back, which did not disappear. This change seemed to be an alteration in colour, as very few feathers were shed during the change. He remained in this state of plumage till about the 4th of August, when he commenced moulting, and about the 14th, the white feathers on the breast and back began to reappear. On the 21st he was full of new feathers and getting the white plumage fast.

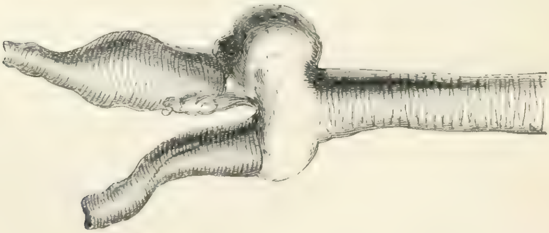
A male bird of the year 1842, received from Norway in October 1844, did not acquire his perfect breeding plumage this last summer (1845).

Eleven young birds of the season of 1844, were received at the Gardens from Scotland on the 24th of August: they were then about eleven weeks old, of a dark brown colour, and without distinction in plumage as to sex. About a month after their arrival the male birds began to get much darker in colour, almost black, and by the middle of October a few white feathers began to appear on the back. The white feathers did not appear on the breast till the middle of November. This change seemed to go gradually on till June, when the breeding plumage was observed to be about half perfect. They began to lose their white plumage about the same time as the oldest male, but not so much of it, as a number of the white feathers remained on the back and breast. They commenced moulting about the same time as the old bird, and the white plumage came on in them much the same as on him. No perceptible change takes place in the plumage of the females.

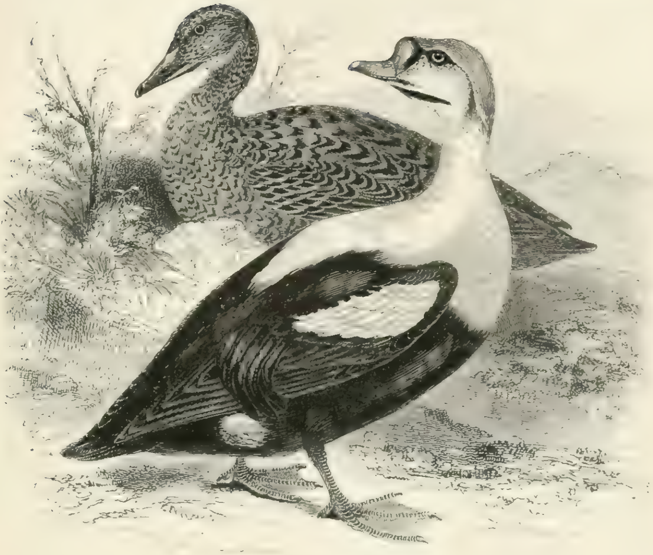
A pure white female Eider is in the collection of Mr. F. Bond.

The downy nestling is of a nearly uniform umber-brown above, and greyish-brown below; the throat is brownish-white, and there is a well-defined streak of the same colour, from the base of the bill, above each eye; bill dark olive, with a yellowish-brown nail.

The windpipe of the male Eider measures nine inches in length, the tube uniform in size throughout; the bony labyrinth and inferior tubes as represented below.



ANSERES. *ANATIDÆ.*



Somateria spectabilis (Linnæus*).

THE KING EIDER.

Somateria spectabilis.

The King Eider or King Duck has a less southern breeding-range than the preceding species, and its appearances on the coasts of the British Islands are rare and irregular. It is, naturally, more uncommon in the south than in the north, and, as regards England, the genuine instances may easily be counted. The authenticity of a King Eider mentioned by Messrs. Paget on the authority of Mr. Lily Wigg, as having been killed at Breydon in Norfolk, in July 1813, is more than doubtful; and the same may be said of a bird said to have been killed at Aldeburgh, Suffolk, in 1827, and another at Lowestoft in 1854. Mr. J. H. Gurney, jun., has a female which was obtained, freshly killed, in Leadenhall Market on the 17th November, 1870, by Mr. Gatcombe; and the latter states that some years ago he saw an immature bird in Plymouth market. A record in 'The Field' of the 6th November, 1875, of a supposed female of this species having recently been procured at Malden in Essex, was subsequently admitted to be a mistake; but weeks after the correction the then Editor of 'The Zoologist' unfortunately gave currency to the error by quoting the first statement without its recantation (Zool. s.s. p. 4766). At Bridlington, Yorkshire, one was shot early in August 1850. Further north, at the Farne Islands, a male and a female were observed throughout the summer of 1873; and on the 14th of the following November an adult male, presumably the same, was obtained there and passed into the collection of Mr. Raine of Durham. In the same locality a pair are said to have been observed in May 1880; and Mr. H. M. Wallis informs the Editor, that he had a good view of an adult male off that group of islands at the end of May 1882.

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* *Anas spectabilis*, Linnæus, Syst. Nat. Ed. 12, i. p. 195 (1766).

In Scotland, the late Dr. Nelson told Mr. R. Gray that he saw one on the coast of Haddingtonshire in the winter of 1847; and Mr. Harvie-Brown informs the Editor that he recently observed an adult male off the Isle of May. Mr. R. Walker has recorded the occurrence of a small flock at the mouth of the Tay in the spring of 1872; an adult male and three females being subsequently obtained. As regards the Orkneys, Bullock's statement to Montagu, that he had actually found the nest with six eggs "on a rock impending the sea" at Papa Westra, must be taken for what it is worth, for it has never received any subsequent confirmation, although few groups of islands have been more frequently explored; but a bird mentioned by Messrs. Baikie and Heddle was exhibited before the Zoological Society by the late Mr. Gould in 1832; and Mr. E. Hargitt has a female which he shot off Stromness on the 22nd of May, 1868, as well as another shot there by the late J. H. Dunn, on the 11th December, 1869. The late Robert Dunn, writing from Helister, Weesdale Voe, Shetland (Zool. p. 2188), states that he shot one out of a pair at the mouth of the Voe on the 20th of April, 1846. Mr. C. Dixon states that he observed two pairs in June 1884, off St. Kilda, and he had "not the slightest doubt that they were nesting on the precipitous island of Doon"; however, the fact of the males and females being seen swimming side by side, as he also states, seems rather to militate against this assumption, for the males generally separate from the females as soon as the latter begin to lay.

In Ireland, according to Thompson, a King Eider was shot in Kingstown Harbour in October 1837; in co. Kerry, one at Derrynane, in the winter of 1843, and one at Tralee Bay in that of 1845–46; and a female in Belfast Bay on the 11th March, 1850.

There is an authentic specimen of the King Eider in the Museum at Boulogne: apparently the most southern locality on record; and even on the coasts of Holland, Denmark, and the Baltic this species is of very rare occurrence. It has not been known to breed in the Færoes, to which it is only an irregular visitant; nor has it been found nesting on the coast of Norway, although flocks occur in the northern districts every winter. In Iceland it is rare, and its reputed nesting rests on Faber's statement that a pair did so on Videy in 1819 and 1820. It is doubtful if it breeds on Spitsbergen, where it has been observed: it nests, however, on Novaya Zemlya; on the Kanin Peninsula; on the Yalmal Peninsula, between the Kara Sea and the Ob; and along the Arctic shores of Siberia. Von Middendorff observed it on passage on the Boganida, finding its nest on the Taimyr in about 74° N. lat.; and the 'Vega' expedition obtained it at Pitlekaj.

In America, the summer quarters of the King Eider extend throughout the Arctic regions from the Pacific to the Atlantic; its northward range reaching nearly as far as man has penetrated, for several nests were found by Major Feilden when in H.M.S. 'Alert,' in 82° 27′ N.; while southwards it has been found breeding in the Province of Quebec, in about 50° N. In Greenland it breeds in Disco Fjord, near Godhavn, and at Upernavik, although by no means so abundant there as the Common Eider; and it is only to be found in any considerable numbers in the regions which lie further to the west. Sabine states that the King Eider was very abundant in the North Georgian Islands, nesting on the ground in the neighbourhood of fresh-water ponds, and feeding on the aquatic vegetation. In winter it occurs as far south as the latitude of New York, both on the coast and on the great lakes; and Mr. Henshaw has recently recorded it from California.

Its nesting habits are similar to those of the Common Eider. Its eggs are subject to the same varied shades of green, but in size they are decidedly smaller, measuring about 2·6 by 1·9 in.

The food of the King Eider consists chiefly of crustaceans and mollusks; and Mr. Collett says that in the stomach of a bird shot at Stromsö he found five uninjured specimens of *Pecten islandicus*, the shells of which measured more than an inch in diameter. The flesh of this Duck is, naturally, not much esteemed, but the lump of fat at the base of the bill in the adult male is considered a great delicacy by the Eskimo.

The adult male has the beak reddish-orange, bounded with a black line; the irides yellow; cheeks white, tinged with green; top of the head and the occiput bluish-grey; lower part of neck behind, the upper part of the back, and the scapulars white; lower part of the back, the rump, and upper tail-covert black; the point of the wing black; wing-coverts white; all the wing and tail-feathers dark brown, with a rufous tinge on the inner web; the ends of the elongated scapulars and inner secondaries fall in curves over the wings; under the chin is a chevron of black; front of neck and breast white, the latter tinged with creamy-buff; the lower part of the breast, the belly, and all the under surface black, except a white patch on the flank; legs and toes orange-red, membranes darker.

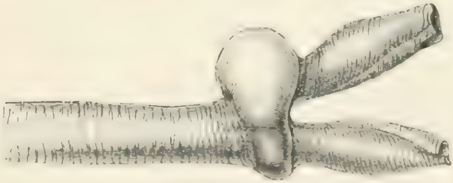
The whole length is twenty-four inches. From the carpal joint to the end of the longest quill-feather eleven inches and a half.

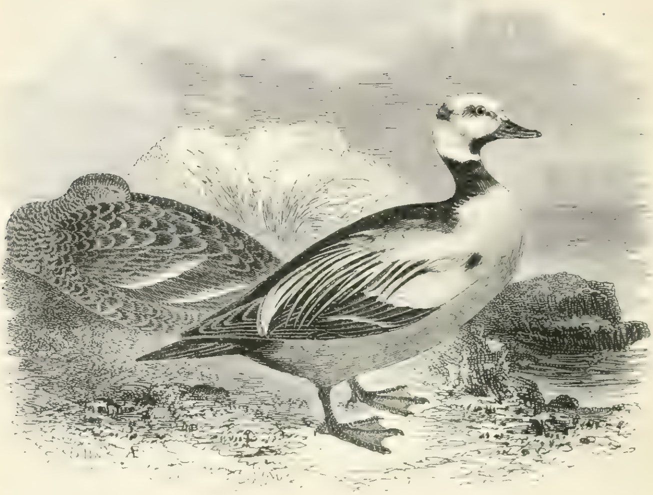
The female has the beak greenish-brown, and the whole of the plumage of two shades of brown, the darker colour occupying the centre of each feather of the back, the margins being bright rufous; the brown on the head and neck rather lighter in colour than the other parts of the body. She may be distinguished from the female of the Common Eider by the central line of feathers on the upper mandible running down to the nostrils, whereas in the Common Eider it hardly reaches half way: she is also ruddier and smaller.

Young males at first resemble the females; at a later period one described by Richardson had the head and neck dusky yellowish-grey, crowded with black spots; upper plumage mostly pitch black, with yellowish-brown edgings; breast and flanks yellowish-brown, spotted and barred with black; belly of the same colours intimately mixed; bill as in the female.

In a downy nestling in the British Museum, the bill is narrower than in the Common Eider; the down of the central ridge runs down to the nostrils in the same characteristic manner as the feathers in the adult; the upper parts are only a trifle more rufous, but the cheeks, throat, and under parts are much lighter and yellower than in the preceding species.

The representation of the lower portion of the trachea here given is of a natural size.





Somateria stelleri (Pallas*).

STELLER'S EIDER.

Somateria dispar.

Steller's Eider, often called Steller's Western Duck, is an inhabitant of the Arctic regions, which occasionally straggles to the temperate portions of Europe in winter, and has twice occurred in England. The first example was shot on the 10th of February, 1830, at Caistor, in Norfolk, and was soon afterwards presented to the Norwich Museum by the Rev. George Stewart, as stated by the Messrs. Paget, in their Sketch of the Natural History of Yarmouth and its neighbourhood. By the kindness of Mr. Charles Buckler, who furnished a drawing taken by himself from the bird at Norwich, the Author was enabled to give an exact representation of that British-killed specimen. It is a male closely approaching the adult plumage.

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[*] *Anas stelleri.* Pallas, Spicilegia Zoologica, fasc. vi. p. 35, tav. v. (1769).

The late Mr. G. N. Curzon informed the Author that on the 15th of August, 1845, he shot a solitary bird of this species sitting on the sea off Filey Brigg, Yorkshire. The skin, which he obligingly sent for the Author's examination, was that of a male, but it exhibited the colour of the plumage of the female over the head and neck; the autumn moult having commenced, the white feathers about the head, and the black feathers on the chin and on the bottom of the neck, which distinguish the adult male, were just beginning to make their appearance. The bird was preserved for Mr. Curzon, and has ever since been in the possession of his brother, Lord Scarsdale.

An example of Steller's Eider was obtained, according to Degland and Gerbe, in 1855, between Calais and Boulogne. It has been observed on several occasions at Heligoland; there are two records of it in Denmark; and in the Baltic it appears to be not uncommon. To the unfrozen water of the coast of Norway it is an annual visitant, and, rounding the North Cape, its most western breeding-place is on the Varanger Fjord, just within Norwegian territory. Eastward it breeds on the coast of Russian Finmark, and eggs and down were taken at Petschinka in 1870, but there is no record of its occurrence at Archangel, or on Novaya Zemlya, or along the Arctic coast of Siberia short of the Taimyr Peninsula, where Von Middendorff found the bird abundant and nesting on the 'tundras.' Dr. A. Bunge found it still in flocks in June, at the mouth of the Lena, and had two eggs brought to him on the 4th of July. The 'Vega' expedition procured specimens in July at Pitlekaj, close to Bering Strait, and its range can be traced down the coast of Kamtschatka—where the species was first obtained by Steller—to the Kuril Islands. Across Bering Sea by way of the Aleutian and Pribilov Islands, we follow it to Alaska; its head-quarters in that region being at Unalashka, where Mr. Dall, who speaks of it as very abundant, found it nesting on Amaknak Island. There is at present no record of Steller's Eider along the American shores of the Arctic Sea until we reach Cumberland Bay, to the south-west of

Davis Strait, where Mr. L. Kumlein observed several examples while the Howgate Polar expedition was jammed in the ice; and he adds that an adult male, shot in Disco Fjord in August 1878, is in the collection of Governor Fencker of Godhavn: apparently the first record of this species in Greenland.

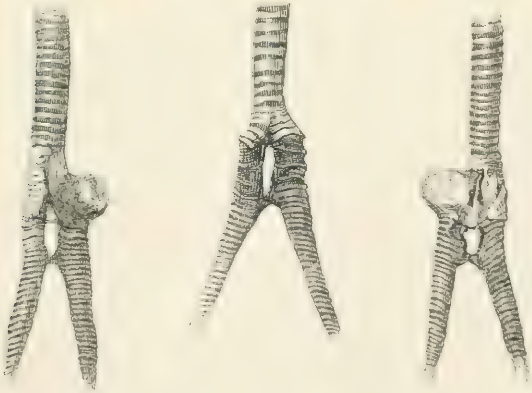
Von Middendorff describes the nest of Steller's Eider as cup-shaped and lined with down, placed in the moss on the flat 'tundras': the eggs, seven to nine in number, of a pale greenish-grey colour; average measurements 2·2 by 1·6 in. Three are figured in his 'Sibirische Reise' (tav. 23, figs. 3–5), and one, from the same source, by Prof. Newton (P. Z. S. 1861, pl. xxxix. fig. 4).

It is stated of this species that it flies in flocks, and never enters the mouths of rivers. Its food is marine insects and mollusks; and its cry is said to be similar to that of the Common Teal, but harsher. The species has been assigned to several genera, but it varies little, except in the shape of the bill, from typical *Somateria*, in which genus the Author placed it.

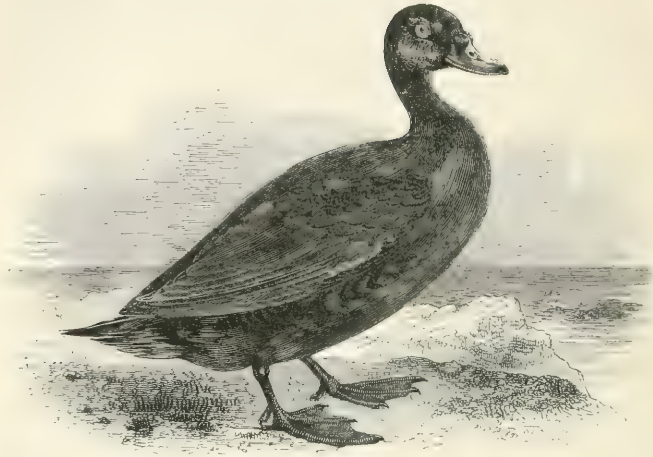
In the adult male the bill is brownish-black; the irides pale brown; round the eye a ring of black; between the beak and the eye, nearly meeting across the forehead, a patch of pale green; on the occiput a band of pale green with black ends; crown, cheeks, and part of the neck behind white; below the white on the neck there is a collar of bluish-black, which ends in a broad stripe, passing the whole length of the middle of the back and upper tail-coverts, this latter portion tinged with raven-blue; the wing-primaries and tail-feathers brown; the secondaries in part white, with a dark blue outer web forming a rich speculum; the terminal portions white; each inner secondary feather white on the inner web, rich blue on the outer web, and curved downwards towards the end; wing-coverts white; scapulars elongated, and, like the inner secondaries, with the narrow inner web white, the broader outer web rich blue; chin and throat rich bluish-black; below the broad collar is a narrow band of white, the colour extending over the sides of the neck to each wing; just below the point of the wing some of the white feathers have black at the tip, forming a dark patch; middle of breast and belly rich chestnut-brown, passing off into a buff-colour on the front, sides, and flanks; vent and under tail-coverts dark brown; legs, toes, and their membranes black; the hind toe with a deep lobe. Whole length nineteen inches; from the point of the wing to the end of the longest quill-feather nine inches.

The female is dark brown, mottled with rufous, especially about the neck and breast; the greater coverts and the secondaries tipped with white, forming two bars enclosing between them a bluish-black speculum. The figure is taken from Nilsson's coloured plate.

The Author was indebted to Prof. Newton for the drawing representing two views of a portion of the windpipe of the male, and, in the centre, that of the female; but the engraver having omitted to reverse the drawings, the representations are in this particular inaccurate.



ANSERES. *ANATIDÆ.*



ŒDEMIA NIGRA (Linnæus[*]).

THE COMMON SCOTER.

Oidemia nigra.

ŒDEMIA, *Fleming*[†].—Bill swollen or tuberculated at the base, large, elevated, and strong; the tip much depressed, and terminated by a large flat nail, rounded and slightly deflected at the extremity; mandibles laminated, with the plates broad, strong, and widely set. Nostrils lateral, elevated, oval, placed near the middle of the bill. Wings rather short, pointed. Tail short, graduated, acute. Legs far behind the centre of gravity; tarsi short; feet large, of four toes, three in front, and one behind. Outer toe as long as the middle one, and much longer than the tarsus; hind toe with a large lobated membrane.

THE COMMON SCOTER is principally a visitor to the British coasts in winter, at which season, especially on the eastern side of Scotland and England, it is often to be found in numbers exceeding those of any other species of Duck. At times the waters between the Eastern Counties and Holland are black with them; and large flocks are to be

[*] *Anas nigra*, Linnæus, Syst. Nat. Ed. 12, i. p. 196 (1766).

[†] *Oidemia*, Fleming, Philosophy of Zoology, ii. p. 260 (1822).

observed throughout the entire length of the English Channel. Comparatively few approach the shores, or enter the bays, except in coarse weather; but storm-driven birds are occasionally to be found on inland sheets of water. On the western side of England and Scotland it is less abundant. In spring the majority of our winter visitants take their departure for the north-east of Europe; but a certain number remain to breed in the boggy swamps of Caithness. Mr. J. Watson states (Zool. s.s. p. 1867) that he saw three pairs of birds, and obtained a female with nine eggs, at Strathmore; and a few also breed in Sutherlandshire and Inverness-shire.

In Ireland, Sir R. Payne-Gallwey states that on the northern marine loughs and in the bays, especially at Belfast and Dundalk, Scoters abound every winter: and sometimes they are to be seen in thousands. On the west coast they are considered uncommon, and in the south more than six or eight are seldom seen together.

The Scoter visits the Færoes, and breeds sparingly in Iceland. In Norway, Sweden, and Northern Russia, it is a generally distributed species during the summer; and on the coasts and some of the inland waters of the rest of Europe, it occurs with tolerable regularity in winter. On the northern shores of France it is excessively abundant, and some remain there throughout the year. Westward its migrations extend to the Azores; it is very common off the coast of Portugal in winter, and it visits the south of Spain and the shores of North-western Africa; but it is very rare throughout the rest of the Mediterranean.* It appears to pass along the valley of the Volga to the Caspian; and Canon Tristram says it is found on the coast of Palestine in winter. Its breeding-range probably extends across the mainland of Northern Asia; for Von Middendorff shot a pair nesting on the Boganida; but in Japan and the North

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* In French the ordinary name of the Scoter is *Macreuse*, but in Provence the term is applied to the Coot (*Fulica atra*). Ignorance of this fact led the Author to publish in former Editions a long account of the *battues* directed against the Coots on the salt-lakes of Provence, under the impression that the species intended was the Scoter; the latter is, however, almost unknown there, and has only once been recorded on the shores of Italy.—[Ed.]

Pacific it appears to be replaced by a closely-allied species, *Œdemia americana*, in which the entire protuberance at the base of the upper mandible is orange-yellow, this colour extending a little in front of the nostrils; whereas in our Scoter there is only a yellow line from the base of the bill over the centre of the protuberance, and a patch of the same colour from the nostrils to the lamellæ of the bill, the protuberance itself being blackish-blue. This American species is found throughout the Nearctic region.

The nest of the Scoter is generally placed on an island in a fresh-water lake, or in the bogs in the vicinity; it is composed of grass and moss with a lining of down, and the eggs, which are usually laid from the beginning to the middle of June, are from six to nine in number, of a yellowish-white colour; average measurements 2·5 by 1·8 in. The late Mr. Wolley, in a letter written from Muonioniska, and quoted in Hewitson's 'Eggs of British Birds,' vol. ii. p. 422, says, "If you wish to give a cockney a correct notion of the rich look of a fresh Scoter's egg, you may tell him that it is like a fully ripe magnum-bonum plum."

The Scoter feeds almost exclusively on the soft bodies of mussels, and the animals of other bivalve shells, which it obtains by diving, and generally it approaches the shore with each flood-tide for the purpose of satisfying its appetite. The flesh of the Scoter is oily, and has a strong fishy taste; it is, in consequence, but seldom eaten in this country. The call-note during the breeding-season is said by Faber to resemble the syllables *tii-tii, tii, tii*, on the part of the male, the female responding with a harsh *re-re-re-re-re*. Like the rest of the genus, the Scoter dives remarkably well, and can remain a considerable time under water.

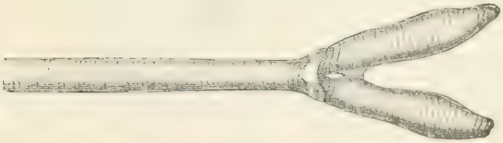
In the adult male the beak is black, except the central ridge of the upper mandible, which is orange; the irides brown; all the plumage deep black; legs and toes dusky-black, the webs darker, or quite black. The whole length is nineteen inches. From the carpal joint to the end of the longest quill-feather nine inches: the second quill-feather rather the longest in the wing.

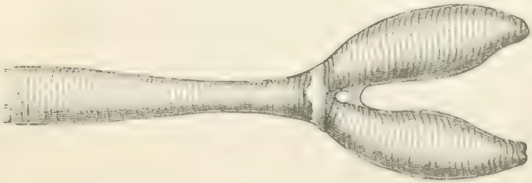
In the female all the upper surface of the body is of a uniform blackish-brown, the margins of the wing-coverts a little lighter; cheeks, and sides of the neck paler brown; lower part of the neck, the breast, abdomen, vent, and under tail-coverts, dark brown; legs and toes brown, tinged with green: the interdigital membranes almost black.

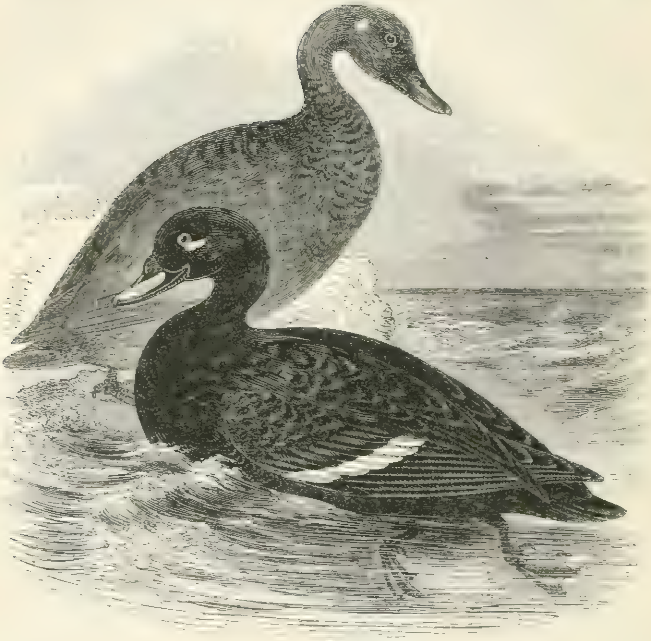
Young birds of the year, at the approach of their first winter, have the cheeks, chin, sides and front of the neck, dull greyish-white, and the under surface of the body mottled with white and brown.

The downy nestling has the upper parts unspotted umber-brown; chin white; cheeks greyish; under parts greyish-brown, with a dark pectoral band.

The trachea of the male Scoter contrasts with that of the male of any other species among the Ducks, in having no bony enlargement; while it only differs from that of the female in having the principal tube, as well as the bronchial tubes, rather larger. Portions of both are figured below.







ŒDEMIA FUSCA (Linnæus*).

THE VELVET SCOTER.

Oidemia fusca.

THE VELVET SCOTER is a visitor to the sea-shore of the British Islands in autumn and winter, but it is far less numerous than the preceding species. Mr. Cordeaux observed that in Lynn and Boston 'deeps,' almost every flock of the Common Scoter had a pair or two of the Velvet Scoter swimming with them; and the Editor remarked the same upon the Lancashire coast. The present species is easily distinguished by the white patch on the wing, and, when flying, the male is not unlike an old Black-cock. On the south coast of England it is not unfrequent in winter, but never numerous, the narrow seas being ill-suited to a species which, as a rule, likes to keep at some distance from land. It is, however, occasionally found on inland waters, and Mr. Abel Chapman informs the Editor that he once shot an adult female on Darden lough, Northumberland, twenty-three miles from the sea and 1200 ft. above it. On the coast of that county it is of irregular occurrence in winter; but Mr. George Bolam records an exceptional instance of a male bird which frequented the rocks in the vicinity of Berwick pier throughout the summer of 1879. It was constantly seen by the men engaged at the salmon fishery there, and used often to allow their boat to pass quite close to it without any apparent alarm; never more than one bird was seen at a time, and it remained in the neighbourhood until about the middle of September.

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* *Anas fusca*, Linnæus, Syst. Nat. Ed. 12, i. p. 196 (1766).

Mr. R. Gray speaks of the Velvet Scoter as more abundant on the east side of Scotland than on the west; and Saxby says that it is merely an unusual winter visitant to the Shetlands, although rather common in the Orkneys, especially after southerly gales. There is evidence that the Velvet Scoter may occasionally have bred in some parts of Scotland, for eggs taken there, and resembling the somewhat unmistakable ones of this species, have been shown to Mr. H. J. Elwes, and others were brought to Mr. E. T. Booth, but as yet the supposition has not been confirmed by the capture of the parent bird. On the Irish coast the Velvet Scoter is comparatively rare, and on the western side it is almost unknown; but off the south coast, and far out at sea in the Irish Channel, it is not unfrequently met with.

It has been erroneously stated that the Velvet Scoter inhabits the Færoe Islands and Iceland, but as a matter of fact it has only once been recorded in the former, and not at all in the latter. A single specimen obtained near Godhaab, Greenland, is now in the Copenhagen Museum. As regards Scandinavia, the following remarks were supplied to the Author by the late Richard Dann:—"This Duck is common during the summer months in the interior of the whole of

Scandinavia, north of lat. 60°. It frequents and breeds on the large lakes in the mountainous districts, especially those of which the shores are flat and boggy, and covered with vegetation. In Lapland it is common everywhere; also appearing in the Dovre Fjeld, at the latter end of May; and frequenting the lakes as high as the birch grows." The breeding-range of the Velvet Scoter extends across Finland and Northern Russia; and Naumann states that this species occasionally nests in Mecklenburg. It visits the Baltic and the coasts of northern and temperate Europe, in winter; and Lord Lilford observed a small flock at Santander, in the north of Spain, throughout the month of May 1876; he also saw a single bird there as late as the 21st of June, and a large flock at the mouth of the Gironde on the 24th of that month. In the western portion of the Mediterranean the Velvet Scoter is as yet unrecorded; but small numbers visit the Adriatic every winter; and further east, as well as in the Black Sea, it occurs sparingly. Von Heuglin's statement that it is a straggler to Lower Egypt is as yet unconfirmed.

In Asia the Velvet Scoter is found in winter on the Caspian and in Turkestan, but it has not yet been recorded from India. Mr. Seebohm did not obtain it on the Yenesei; but it probably breeds in some parts of north-eastern Siberia for it occurs in summer in Northern Mongolia, and in the Bureja Mountains, visiting the Sea of Okhotsk, Mantchuria, Japan, and China, down to the Yangtze, in winter. It has recently been recorded by Prof. Ridgway as occurring in Alaska, where, however, the predominant species is the North American *Œdemia velvetina*. The latter is slightly smaller; in the male the maxilla near the rictus is deeply sunken, and not swollen as in our bird; there is no black line across the red portion of the mandible, and the base of the culmen is elevated into a prominent knob. This American form replaces ours throughout that continent, except in Alaska, where the two meet. Audubon's account of the nesting of the Velvet Scoter in Labrador—quoted in former Editions—refers to the American species, but his descriptions of the birds were taken from European examples.

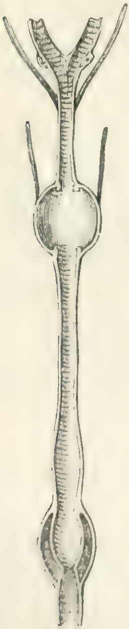
The Velvet Scoter is one of the latest breeders, seldom having eggs before the beginning of July. The nest is placed in a dry spot, often at a considerable distance from water, in a mere depression under some bush or tree, and lined with leaves and down. The eggs, about eight in number, are rather large, of a clear creamy-white, and average 2·75 by 1·9 in.

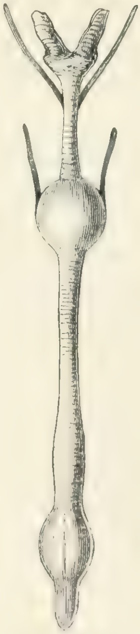
From its habits of diving rather than flying when approached, the Velvet Scoter sometimes becomes entangled in the meshes of the nets of our sea fishermen ; and it is also occasionally caught in the stake nets set for salmon, as noticed by Selby, who mentions that in those he had dissected, the gizzard, which was large and strong, was filled with the remains of shelly mollusks, intermixed with the spawn of fish or crustaceans. It frequents soundings in flocks of ten or twelve, generally feeding in the middle or deep water, and in the stream of the tide. It is remarkably shy, and great caution is required in approaching it. Its flesh is in no estimation.

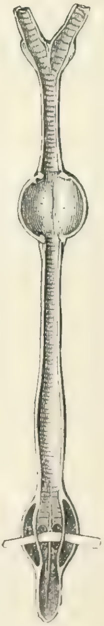
The adult male has the beak pale orange, based and edged with black, a diagonal line of the same colour running from each nostril to the nail of the beak ; the irides chalk-white ; the eyelids and a small patch behind each eye white ; the ends of the secondary quill-feathers white, forming a conspicuous bar across the wing ; all the rest of the plumage uniform velvet-black ; the legs and toes dull crimson-red, the intervening membranes nearly black. The total length is twenty-two inches ; from the point of the wing to the end of the longest quill-feather, ten inches and three-quarters. Weight about 4½ lbs.

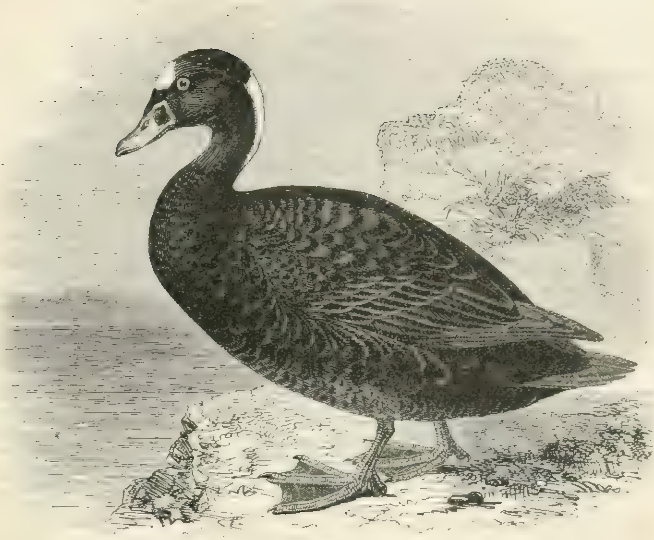
In the female, the basal prominence of the bill is much less elevated, and the colour of the whole bill is dusky. The irides are brown ; the legs and feet are paler than in the male ; the general colour of the plumage is a sooty-brown ; the breast and abdomen lighter ; there are two whitish spots on each side of the head, one near the base of the upper mandible, the other behind the eye ; the secondary quills are white, as in the male. Weight about 3 lbs.

The trachea of the male Velvet Scoter is remarkable for a hollow bony enlargement situated about two-thirds down the tube, made up of expanded tracheal rings, which in the adult are firmly ossified together. Upon each side of this enlargement a small muscle passing downwards is inserted upon the inner side of the shaft of the merrythought. On making a longitudinal lateral section, as shown in the outside figures below, the inner tube of the trachea, at its upper part, exhibits an aperture on each side by which it communicates freely with the cavity within another bony enlargement situated immediately below the superior larynx, and brings to mind the laryngeal cavities found in some of the higher animals. A slip of paper is represented as passing through both apertures.









ŒDEMIA PERSPICILLATA (Linnæus*).

THE SURF SCOTER.

Oidemia perspicillata.

THE SURF SCOTER is a North American species which has been obtained, as a straggler, a good many times on the shores of our islands; and it is probable that its occurrences, especially on the western side, are not so rare as was formerly supposed. The earliest mention appears to be by the late Mr. Blyth, who wrote in 1838, in Neville Wood's 'Naturalist' (vol. iii. p. 420), that "a few seasons ago Mr. Bartlett received a recent Surf Scoter for the purpose of stuffing"; and from that specimen the Author derived the measurements here given and some further particulars. Mr. William Thompson of Weymouth informed the Author that a

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[*] *Anas perspicillata*, Linnæus, Syst. Nat. Ed. 12, i. p. 201 (1766).

Surf Scoter was obtained near that place, in the winter of 1851, and a young male shot there in December 1853, passed into Mr. Thompson's collection. Dr. Bullmore has mentioned a mutilated specimen which was found, many years ago, on the beach near Pendennis Castle, Cornwall. Towards the end of September, 1865, an adult bird, picked up in a dying state on the beach at St. Mary's, Scilly, was brought to Mr. J. H. Jenkinson, and came under the inspection of the late Mr. Rodd, before it was skinned; and on the 28th of October, 1867, an immature example which had been shot at Trescoe was sent for preservation to Mr. Vingoe of Penzance. In Lancashire a female was shot by Mr. R. H. Thompson on the 9th of December, 1882, opposite Lytham, and identified by Mr. A. G. More (Zool. 1884, p. 29). One killed at Crofton, Cumberland, and figured by Eyton, in his 'Rarer British Birds' (p. 81), is now in the collection of Mr. J. H. Gurney.

The late Robert Dunn stated (Zool. p. 2067) that in June 1847 he saw an adult male several times in Rona's Voe, Shetland, but he was unable to obtain it; nor has the species yet been recorded from that group of islands. In the Orkneys, however, it seems to be of frequent—and perhaps annual—occurrence, from autumn to spring, although never in any great numbers. An adult male was shot at Swanbister, in the parish of Ophir, in March 1866; one—perhaps the same specimen—was in the collection of the late Joseph H. Dunn; and another, which was doubtless killed in the Orkneys, is in the local museum at Stromness. Capt. Clark-Kennedy has recorded, in 'The Field' of March 11th, 1876, one obtained off Hoy Island in 1872, and another at the entrance of Loch Stennis, Stromness. In the same paper, under date of 18th March, 1876, Dr. Rae remarks:—"In the latter part of September, or during October, I have seen one or more in Orkney for the last ten years, in the large bay which separates Kirkwall from Firth and Rendall." In February 1875, Mr. T. M. Pike, when staying at Stromness, got close to, and fired unsuccessfully at a Surf Scoter which was swimming with three Velvet Scoters in the

Sound, near Rysa Little ; and exactly a year later he killed at the same place, and in similar company, a fine adult male (Zool. 1879, p. 335). The Rev. S. A. Walker informs the Editor that on the 23rd October, 1880, he obtained an adult male off the above-mentioned Rysa Little, the trachea of which was described by Mr. Herbert Langton (Zool. 1881, p. 59). On the 20th of November, 1884, Mr. Walker saw, but did not obtain, another male of this species, swimming in the same waters in company with Velvet Scoters ; this bird was very tame, but, owing to the wildness of its companions, it could not be approached, although generally the last to leave the water and the first to drop. In the Hebrides a Surf Scoter was shot near Stornoway in the winter of 1865, and passed into the collection of the late Sir James Matheson. On the south-east coast of Scotland one was killed in Musselburgh Bay, Firth of Forth, in 1852.

In Ireland, according to Thompson, several were seen in the early part of the autumn of 1846 in Belfast Bay, an adult male being shot on the 9th of September, and presented by Dr. Cupples to the Belfast Museum, where it now is. Another is stated by Sir R. Payne-Gallwey to have been shot in October 1880, at Clontarf, co. Dublin, by Mr. E. Hanks, and was presented by him to Mr. Bradshaw, of the Rectory.

The Surf Scoter has been obtained once in the Færoes ; on several occasions in Swedish Lapland ; and at least three times on Aland, at the junction of the Gulf of Bothnia and the Baltic : two of the latter examples being in the Helsingfors museum. One, killed off Heligoland on the 9th of October, 1851, is in the collection of Mr. Gätke. Records of the occurrence of this species in Germany, and on the coast of Flanders, are of somewhat doubtful authenticity ; but Degland and Gerbe mention one killed near Calais in the winter of 1835 ; one obtained in the market of Caen in 1841 ; four or five sent up to Paris between 1845 and 1852 ; and four or five in the winter of 1864. In the fine collection of M. Marmottan, there are no less than six adult males, obtained at the mouth of the Somme in various winters between 1869 and 1879.

In Greenland the Surf Scoter has been obtained, as a straggler, on both the east and the west coasts; but its home is in the northern regions of America, its summer range extending to the shores of the Arctic sea where Richardson found it breeding. It nests on the lakes and ponds of the interior of Newfoundland, and in the Province of Quebec; Audubon, as hereafter mentioned, found it breeding in Labrador; it remains in the Hudson's Bay districts as long as the waters remain unfrozen; Mr. MacFarlane found it nesting in considerable numbers on the Lower Anderson River; and it also breeds on the Mackenzie and the Yukon, as well as in Alaska and Sitka. On the Pacific side it is known to occur in winter along the coast as far as Lower California; Mr. E. W. Nelson mentions it as a common winter resident on Lake Michigan; and it also visits other inland waters down to Ohio. Along the Atlantic seaboard the Surf Scoter is common from September to April, its presence depending as much upon the abundance of its food as upon the severity of the weather. By gunners and fishermen in New England it is known as the 'Skunk-head Coot' and the 'Hollow-billed Coot'; and at Long Island as the 'Spectacled Coot'; the latter word comprising many species of Sea Ducks. Southwards it has been found as far as Florida; on three occasions it has straggled to Bermuda; and it is mentioned by Gosse and March as a visitor to Jamaica.

A portion of Audubon's account is as follows:—"While proceeding towards the sterile country of Labrador, in 1833, I found the waters of the Gulf of St. Lawrence alive with Ducks of different species. The nearer we approached the coast, the more numerous did they become; and of the many kinds that presented themselves, the Surf Duck was certainly not the least numerous. It is true that in the noble bays of our own coast, in the Sound, between New York and the Hook, on the broader waters of the Chesapeake, and beyond them to the mouths of the Mississippi, I had seen thousands of Surf Ducks; but the numbers that passed the shores of Labrador, bound for the far north, exceeded all my previous conceptions. For more than a week after we had anchored in the lovely harbour of Little Macatina, I had been anxiously searching for the nest of this species, but in vain. At length I found that a few pairs had remained in the neighbourhood, and one morning, while searching for the nests of the Red-breasted Merganser, over a vast oozy and treacherous fresh-water marsh, I suddenly started a female Surf Duck from her treasure. The marsh was about three miles in length. The nest was snugly placed amid the tall leaves of a bunch of grass, and raised fully four inches above its roots. It was entirely composed of withered and rotten weeds, the former being circularly arranged over the latter, producing a well-rounded cavity, six inches in diameter, by two and a half in depth. The borders of this inner cup were lined with the down of the bird, in the same manner as the Eider Duck's nest, and in it lay five eggs, the smallest number I have ever found in any Duck's nest. They were two inches and two and a half eighths in length, by one inch and five-eighths in their greatest breadth; more equally rounded at both ends than usual; the shell perfectly smooth, and of a uniform pale yellowish, or cream colour.[*] I took them on board along with the female, which was shot as she rose from the nest. We saw no male bird near the spot; but in the course of the same day met with several males by themselves, about four miles distant from the marsh, as we were returning to the harbour. This induced me to believe, that, like the Eider and other Ducks that breed in Labrador, the males abandon the females as soon as incubation commences. Notwithstanding all my further exertions, I did not succeed in discovering more nests or young birds. The female, which was killed as she flew off from the nest, uttered a rough, uncouth, guttural cry, somewhat resembling that of the Goosander on similar occasions; and I have never heard any other sound from either sex. The Surf Duck is a powerful swimmer and an expert diver; it is frequently observed fishing at the depth of several fathoms; and it floats buoyantly among the surf or the raging billows, where it seems as unconcerned as if it were on the most tranquil waters."

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[*] Nests found by Mr. MacFarlane on the Lower Anderson River were situated at the bases of dry stunted pines, the lower branches of which concealed the sitting birds from view; the eggs were from six to eight in number; of a uniform ivory white colour; average measurements 2·3 by 1·6 in.

Wilson says, "This Duck is confined to the shores and bays of the sea, particularly where the waves roll over the sandy beach. Their food consists principally of small bivalve shell-fish, spout-fish, and others that lie in the sand near its surface. For these they dive almost constantly, both in the sandy bays and amidst the tumbling surf. They seldom or never visit the salt marshes. They continue on our shores during the winter, and leave us early in May for their breeding-places in the North. Their skins are remarkably strong, and their flesh coarse, tasting of fish."

The Surf Scoter has occasionally been known to fly against the lanterns of lighthouses: an action very unusual in this group of Ducks. Mr. Giraud relates that when at Montauk Point, in the autumn of 1834, on walking out in the morning, after a very stormy night, and looking up at the lighthouse, he was surprised to see a bird suspended from the wire frame by which the glass is protected. On taking it down, he found it to be a Surf Scoter. The wind having been very high the night before, and the water having doubtless become so rough that the bird was obliged to take wing, it was attracted by the light, and flying with great force, thrust its head through the wires, and in this situation was strangled.

The adult male has the beak orange-red, deeper above the nostrils, with a square patch of black on each side at the base of the upper mandible; irides straw-yellow; on the top of the head and on the back of the neck are two conspicuous oval patches of white; all the rest of the plumage black; legs and toes orange-red, the membranes brownish-black. The whole length twenty-one inches.

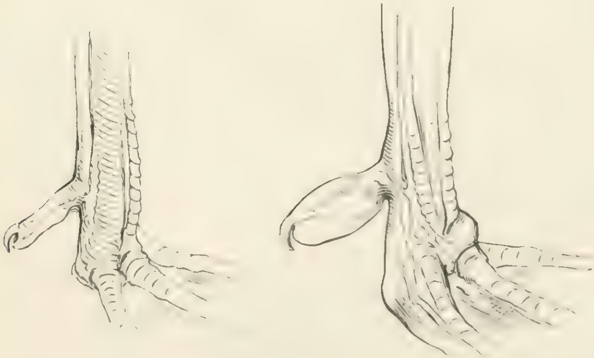
From the carpal joint to the end of the wing, nine inches and a quarter; the first and second primary quill-feathers of equal length, and the longest in the wing.

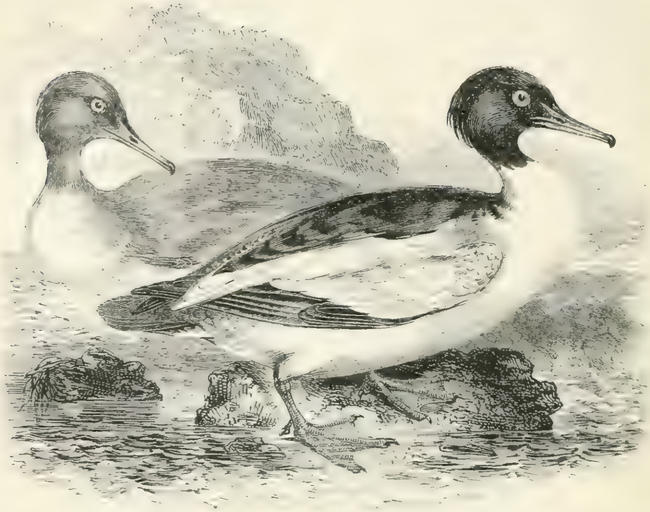
The female differs from the male in having the plumage of dull brown, which is lightest in colour about the cheeks and under surface of the body; the beak dark olive; the feet greyish-brown.

There is considerable individual variation in this Scoter, and some examples from California have been distinguished as *Œdemia* (*Pelionetta*) *perspicillata trowbridgii.*

It has been stated that the trachea of the Surf Scoter resembles that of the Velvet Scoter, but Mr. Herbert Langton, in 'The Zoologist' for 1881, p. 59, points out some differences. An illustration is given by Thompson in the 'Annals of Natural History,' xviii. p. 370.

The vignette below represents the difference in the extent of the membrane depending from the hind toe of the two divisions of true Ducks: that on the left side belongs to the first division, or Surface-feeding Ducks; that on the right to the second division, the Diving Ducks.





MERGUS MERGANSER, Linnæus*.

THE GOOSANDER.

Mergus Merganser.

MERGUS, *Linnæus*†. –Bill about as long, or longer than the head, straight, slender, rather pointed, the base large, forming an elongated and almost a cylindrical cone ; point of the upper mandible curved, and, with the horny nail, forming a hook ; edges of both mandibles furnished with saw-like teeth, the points directed backwards. Nostrils lateral, about the middle of the beak, longitudinally elliptic. Legs short, placed rather backward ; three toes in front webbed, hind toe with a pendant lobe or membrane. Wings moderate, the first and second quill-feathers nearly equal in length.

THE GOOSANDER, the largest of the British Mergansers, a male and female of which are figured above, is mainly to be considered as a winter visitor to our islands, although a small number remain to breed annually among the lochs in some northern localities to be hereafter pointed out. Birds of this species usually make their appearance in November, especially in severe weather, and remain till the end of March; but the greater proportion of them are females, or young birds of the year: the fully-adult male being comparatively rare. All of them frequent fresh-water lakes as well as the sea-shore and estuaries, but if severe frost occurs they are driven to the shelter of deep bays, where, by their powers of diving, they are able to obtain a supply of fish, their principal food. Possessing strong tooth-like processes on the bill, by which it is enabled to hold a slippery prey, this bird, like the Red-breasted Merganser, is also called Saw-bill and Jack-saw.

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* *Mergus Merganser,* Linnæus, Syst. Nat. Ed. 12, i. p. 208 (1766).

† *loc. cit.*

Goosanders in any state of plumage are somewhat irregular visitors to the southern counties of England, although they are sometimes more abundant in certain localities than the Red-breasted Merganser. Examples have been killed during winter in Cornwall, Devonshire, Dorsetshire, and eastward to Sussex, Kent, and Essex; and a few are occasionally exposed for sale in winter in the London markets. On the east coast they are observed nearly every year, and in numbers exceeding those of the other species. Mr. J. H. Gurney, jun., informs the Editor that even in the mild weather of last December and January, Goosanders, in flocks of six or seven females or immature birds with one adult male, had been spending the winter on the waters of Holkam Park and the vicinity; seven such flocks being counted by Mr. S. G. Buxton. Northward to Lincolnshire, Yorkshire, Durham and Northumberland, the Goosander is found in suitable localities, wherever estuaries, or inland waters abounding with fish, invite a stay. On the west side of England it is rarer, although of tolerably general distribution.

In Scotland it is found on both coasts in winter: but although common in the Orkneys, it appears to be a rare visitor to the not distant Shetlands. There can be little doubt that the statements of the late John Macgillivray and Dr. Dewar respecting its supposed breeding in the Hebrides, and of Low as to the Orkneys, refer to the Red-breasted

Merganser, the females of the two species being very similar. The belief that it bred on some of the lochs of the Highlands was not, however, unfounded, although actual proof was not obtained until 1871, when undoubted eggs were sent to Mr. Harvie-Brown by a gamekeeper in Perthshire, the down and a feather from the hollow tree where the nest was placed, being also procured. During succeeding years corroborative evidence has been obtained respecting Perthshire; and Mr. E. Booth has figured in his 'Rough Notes' four young birds which had been watched until they were seven weeks old, "hatched in one of the large pine-forests that stretch for miles along the mountain sides in the Northern Highlands." There is testimony that the species nests, or has done so, in Sutherlandshire, Argyllshire, and elsewhere; on which point many interesting details will be found in a paper by Mr. J. Hamilton Buchanan, published in the Proceedings of the Royal Physical Society of Edinburgh, vol. v. p. 189.

To Ireland the Goosander is, as a rule, a somewhat rare winter visitor, but during the severe January of 1881 more were shot, according to Sir R. Payne-Gallwey, than had ever been known before; as many as eight together being seen on the Blackwater, near Cappoquin. It has never been suspected of nesting in any part of that island.

The Goosander is of very rare occurrence in the Færoes, but it breeds and is said to be resident in Iceland; although it has not as yet been taken in Greenland. It is well known in Norway; Nilsson says it is not uncommon on the lakes and rivers of Sweden; and Dann states that it is widely dispersed from Scona to Lapland, as far as the wooded districts extend, and that it breeds at Gellivara. Linnæus, in his Tour in Lapland, describes a male Goosander which had been caught in a net set for pike, near Lycksele; and Acerbi in his Travels, speaking of the banks of a river near Kardis, in Lapland, says, "The *Mergus merganser*, instead of building a small nest, like the Ducks, on the banks or among the reeds and rushes, chooses to lay her eggs in the trunk of an old tree, in which time or the hand of man has made such an excavation as she can conveniently enter. The person that waylays the bird for her eggs, places against a fir or pine tree, somewhere near the bank of the river, a decayed trunk with a hole in its middle; the bird enters and lays her eggs in it; presently the peasant comes, and takes away the eggs, leaving, however, one or two. The bird returns, and, finding but a single egg, lays two or three more; she is again robbed as before—but a few are left at last for the increase of her family. As soon as the eggs are hatched, the mother takes the chicks gently in her bill, carries and lays them down at the foot of the tree, where she teaches them the way to the river, in which they instantly swim with an astonishing facility."

In Finland and the northern provinces of Russia this species is common throughout the summer, and its breeding range appears to extend to the Ural and the Central Volga districts. Its nest has been taken in Northern Germany; and in Denmark, according to Mr. Benzon, it breeds sparingly, in hollow trees, in all the provinces where the forest is close to the water. In winter it is found on the coasts and inland waters of the Continent so long as they remain unfrozen; its migrations extending to the south of Spain, and to North-west Africa. It is, however, rare in the Mediterranean, although not uncommon in the Bosphorus and the Black Sea. Eastward it is found across Siberia and Central Asia, visiting Japan and China in winter. It is known to breed on the elevated lakes of the great Asian ranges of mountains up to 10,000 feet, and Mr. Hume thinks it probable that in the treeless districts of the Himalayas—where the young, from nestlings to nearly fully fledged birds, have been taken—this species avails itself of holes in the rocks near the water for its nests, after the manner of the Ruddy Sheld-duck. In winter its range southward extends to about 22° N. lat.

In North America is found a sub-species, *Mergus merganser americanus*, adult males of which have the black at the base of the greater wing-coverts exposed, so as to form a very distinct band about half way across the wing, while in our bird the black is concealed by the overlying middle coverts. There is also said to be a difference in the proportions of the bill in the two forms, and by this alone—if it be constant—can the females of each be distinguished. This American form breeds from 42° lat. northwards to the Fur Countries, from ocean to ocean; its winter migrations extending to Texas, Mexico, and, occasionally, to the Bermudas.

As already stated, the Goosander generally makes its nest in the hollow of a tree, or amongst its gnarled roots; sometimes, however, on a ledge of rock, but almost invariably under some kind of shelter. The eggs are of a peculiar creamy-white, very different from the greenish-buff of those of the Red-breasted Merganser, which they have often been said to resemble; average measurements 2·7 by 1·8 in. Mr. Booth has remarked that until the young arrive at the age of a month or five weeks, the female seldom leads her brood into the deep waters of the loch or river, keeping them in the shallows, where there is less danger of their falling victims to their great enemy, the voracious pike. He never heard any sound uttered by the female or brood unless disturbed or driven, or when moving off of their own accord. The note is a low plaintive whistle, not unlike the cry of some young Hawks. He also noticed that although the young birds had not a pinion-feather on their wing-joints, they appeared on rising after a dive to spring upwards and flap along the surface for at least a yard or two, striking the water at the same time with their feet.

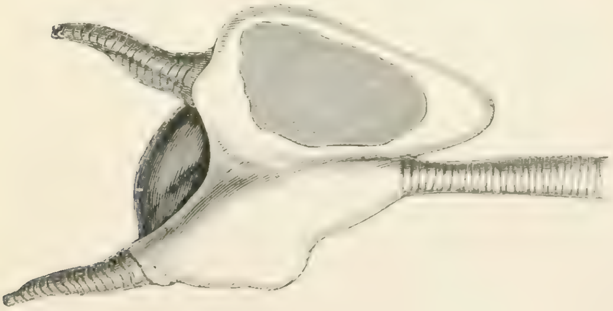
The food of the Goosander consists almost entirely of fish; its flesh is strong in flavour, and scarcely eatable, even by a hungry man.

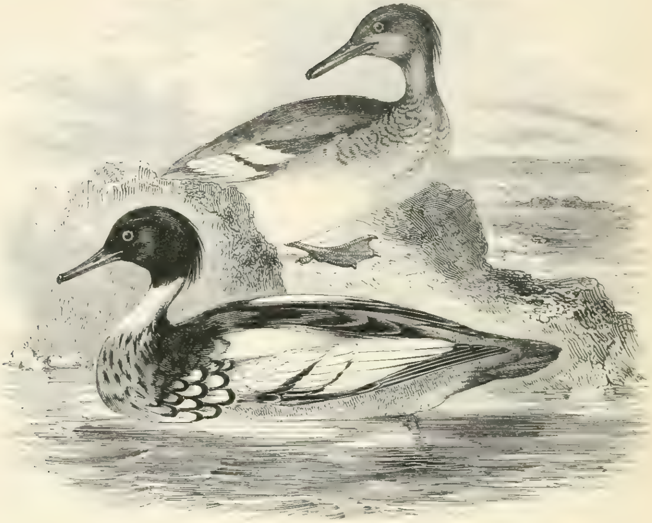
In the adult male the bill is vermilion-red, the superior ridge of the upper mandible and the nail black; the irides red; the head and upper part of the neck rich shining green, with the occipital feathers elongated; upper part of the back and the scapulars black; lower part of the back, upper tail-coverts and tail-feathers ash-grey; point of the wing, and all the wing-coverts white; wing-primaries nearly black; secondaries white; lower part of the neck in front, and all the under surface of the body delicate salmon-buff; legs and and toes orange-red, the webs rather darker; the whole length of the bird is twenty-six inches and a half; from the point of the wing to the end of the longest quill-feather eleven inches.

In the female the bill and irides like those of the male, but not so bright in colour; head and upper part of the neck reddish-brown; the occipital feathers elongated; back, scapulars, inner secondaries, wing-coverts, rump, upper tail-coverts and tail ash-grey; wing-primaries lead-grey; secondaries white; chin and lower part of the neck in front, white; breast, and under surface of the body tinged with buff; sides and flanks ash-grey; legs and feet orange-red. The female is rather smaller than the male.

Young birds in their first plumage resemble the female, but males in this state may be recognized by feeling down the neck in the line of the windpipe, with the finger and thumb: males having two enlargements on the tube, while in females the windpipe is uniform in size throughout its length. Young males may also be distinguished by a rudimentary dark collar at the base of the neck; they do not assume the plumage by which their sex is distinguished till the second year.

The form of the trachea is shown in the vignette below.





MERGUS SERRATOR, Linnæus*.

THE RED-BREASTED MERGANSER.

Mergus serrator.

THE RED-BREASTED MERGANSER is a species that breeds annually in some parts of Scotland and Ireland; though by far the larger portion of the birds which are found in this country may be considered but as winter visitors which arrive here late in autumn, and retire in spring to various parts of Scandinavia and other high northern localities. In winter, particularly during severe weather, they are not uncommon on our coast, appearing to prefer bays and estuaries, but sometimes pursuing the course of rivers and visiting inland waters. On the east coast of England, especially off Lincolnshire and Norfolk, they are decidedly less numerous than the Goosander, and Mr. Cecil Smith

[*] *Mergus Serrator*, Linnæus, Syst. Nat. Ed. 12, i. p. 208 (1766).

thinks that this is also the case in Devon and Somerset; but, as a rule, along the English Channel, as far as Cornwall, the Red-breasted Merganser may be considered the commonest species of the genus. To inland waters its visits are less frequent than those of its larger congener, although it is sometimes observed far up tidal rivers.

In Scotland the Red-breasted Merganser is a well-known and resident species, being, as Mr. R. Gray remarks, an inhabitant of nearly all the lakes of any importance north of Loch Lomond; but on the east coast Mr. Gray had never discovered any breeding-place. It is generally distributed in Sutherlandshire; very abundant about Loch Maree in Ross-shire; and nests freely throughout the Hebrides; also, sparingly, in the Orkneys and Shetlands.

In Ireland this species is more or less common in winter round the coasts, and Sir R. Payne-Gallwey states that in Cork Harbour, during the severe winter of 1878–79, he often noticed from one hundred to even five or six hundred of these Divers together. They nest annually on the islands of Loughs Derg, Ree, Corrib, Erne, Conn, Cullen, Strangford, Neagh, &c., and in many localities along the coast; being generally known to the fishermen and fowlers by the name of 'Sheld-ducks,' and occasionally as 'Spear Wigeon,' on account of the sharp serrated bill.

The Red-breasted Merganser breeds in the Færoes, Iceland, Greenland, Scandinavia, Finland, and Northern Russia; also, sparingly, in the islands of the Baltic, and in Northern Germany. In winter it visits the coasts and inland waters of the Continent, and it is by no means rare throughout the Mediterranean; its migrations extending to the lakes of Algeria, and to Egypt. It ranges across Siberia to the Sea of Ochotsk, the Bureja Mountains, and the Amoor in summer; and to China and Japan in winter. In India, where the Goosander is common during the cold season, the Red-breasted Merganser is either exceedingly rare, or has been overlooked, for Mr. Hume has only recorded the occurrence of a single example, near Kurrachi. In North America it is found throughout the northern districts from the Pacific to the Atlantic, nesting as far north as latitude 73°; its winter migrations extending as far south as the Bermudas.

The nest of this species is placed on the ground, amongst heather, brushwood, or long grass, and is often well concealed beneath a projecting slab of rock, or at the extremity of a small tunnel leading to the centre of a thick growth of bushes and briars. The lining consists of a light grey down with a bluish tint, and the eggs, which seldom exceed ten in number, are drab-coloured with a greenish tinge, and average in measurement 2·6 by 1·7 in. They are usually laid in the latter part of May or early in June. On a small island in Lake My-vatn, Iceland, Mr. C. W. Shepherd found this species nesting in holes among the broken lava, and a female was seen sitting on a nest in which there were also four eggs of Barrow's Golden-eye.

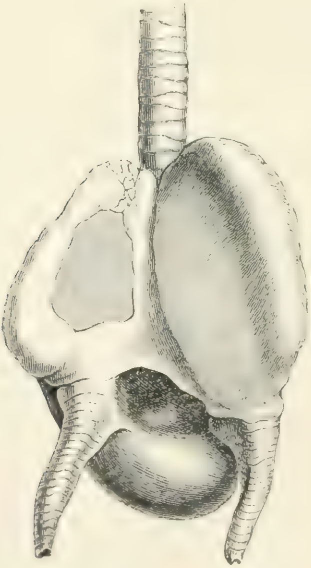
Mr. E. Booth, describing the beautiful bay of Gairloch in Ross-shire, before the erection of the new hotel, says:—"I have repeatedly watched two or three females fishing in a small burn running down within ten yards of the front door of the inn. The party swam in one by one from the bay with the flood, and, joining in company at the top of high water, made their way beneath the bridge, where they eagerly searched the small pools for fish. These birds, as far as I could judge, were sitting on the islands in the bay, and regularly left their nests at this time of tide to seek for food along the shore. The males were seldom seen near at hand, though one would occasionally join the flock if they got on wing after being disturbed. As the females swam back towards the islands where their nests were concealed, a drake would occasionally accompany his mate a short distance, but invariably got on wing before the foot of the rocks was reached. I have more than once had the glasses on the spot to watch the bird make her way to the nest after having observed her leave the water; but although well aware of the exact position of the eggs, she invariably managed to regain her quarters unobserved. In some instances I detected a regular track beneath the heather, along which she was enabled to creep without attracting attention. At this season (the latter end of May), the males had lost the fine plumage they exhibited in winter and early spring."

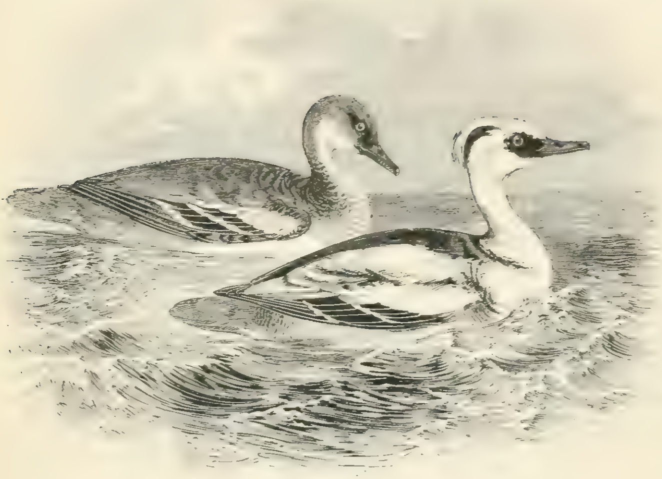
The food of this bird consists of fish and small crustaceans, and its flesh is extremely unpalatable.

In the adult male the upper mandible is dark reddish-brown, except the edges, which are of a brighter red, under mandible wholly red; irides red; all the head and the upper part of the neck dark shining green, the feathers on the crown and occiput elongated; middle of neck all round white, except a narrow line of black descending from the occiput to the upper part of the back, which, with the shoulders, is also black; the short scapulars white, those more elongated are black; before the point of the wing on each side are several roundish white feathers, margined with broad and rich velvet black; point of the wing dark brown; small wing-coverts white; great coverts and secondaries black at the base, the outer halves white, forming with the smaller coverts the conspicuous white bands on the wing; primary quill-feathers brownish-black; inner secondaries white, edged with black; lower portions of the back, the sides, flanks, rump, and upper tail-coverts, grey; tail-feathers stiff, rather pointed, and of a uniform brownish-ash colour; lower part of the neck on the front and sides pale chestnut-brown, streaked, and otherwise varied with black; breast, belly, and under tail-coverts white; legs and toes reddish-orange, the membranes darker reddish-brown. The whole length is fully twenty-two inches. From the carpal joint to the end of the longest quill-feather ten inches.

Females are rather smaller than males, and have the head and neck behind reddish-brown, darkest on the crown of the head, the occipital feathers elongated; all the back, scapulars, and small wing-coverts umber-brown; greater coverts and secondaries dark brownish-black, ending with white, forming two white bands; primaries and inner secondaries dark brownish-black; upper tail-coverts and tail-feathers brown ash-colour; neck in front mottled with reddish and pale brown, on a white ground; all the under surface of the body white. The whole length is about twenty-one inches; the wing nine inches and a half.

Young birds resemble adult females during their first winter. The sex of the males, however, in any state of plumage, may be ascertained by passing the finger and thumb down the neck, along the line of the trachea; the male has an enlargement of the tube before it passes into the body; the tube of the trachea in the female is uniform in its size throughout its whole length. Young males do not obtain their fine plumage till after their second autumn moult, and old males from early spring till their autumn moult begins, lose the rich glossy green of the head and neck, which degenerates into an obscure brown, while the fine chestnut colour of the breast entirely disappears.





MERGUS ALBELLUS, Linnæus.[*]

THE SMEW.

Mergus albellus.

THE SMEW, Smee, or Nun, as it is sometimes called, is a winter visitor to the British Islands, frequenting our rivers and large pieces of fresh water, as well as most parts of the coast, especially in severe seasons. The adult male, a handsome bird, remarkable for the contrast rather than the variety of the colours of his plumage, is, however, decidedly rare, but young birds and females, frequently called Red-headed Smews, are not uncommon. The species appears to be a more frequent visitor to the eastern side of England and Scotland than to the west, and, when found on the latter, it is generally on rivers or fresh-water lochs. In Ireland it is of irregular occurrence on the coast and

[*] *Mergus Albellus*, Linnæus, Syst. Nat. Ed. 12, i. p. 209 (1766).

inland waters in winter, the adult males being very rare in proportion to the females and young of the year, a few of which are obtainable every year in the Dublin market.

The range of the Smew does not extend far to the north-west, and it is unrecorded from the Færoes, Iceland, or Greenland. Even in winter, it is rare on the west and south-west coast of Norway and in the south of Sweden; Finnish-Lapland, whence the late Mr. Wolley obtained the first authenticated eggs on record, being, probably, about the western limit of its breeding-range. Its winter migrations, dependent upon the weather, extend along the northern coasts from the Baltic to the west of France, and down the Atlantic to Morocco; the large inland lakes of Switzerland attract a tolerable number of birds; and a line of migration appears to pass down the Rhone valley to the Mediterranean, for the species is not unfrequent in some winters in the south of France and in the east and south-east of Spain, although very rare in Algeria. It is not an uncommon visitor to Italy and her islands, although very rare in Malta, where, however, Mr. C. A. Wright records the occurrence of an adult male in the winter of 1868. In the eastern part of the Mediterranean, especially in the Grecian Archipelago, as well as in the Black Sea, the Smew appears to be the commonest species of the genus. This is to be accounted for by the fact that, not only does it breed in the northern districts of Russia like its congeners, but it also nests in suitable localities in the valley of the Volga and along the whole line of the Ural Mountains. In Asia its southern breeding limits cannot yet be defined, but the species is found across the entire continent, visiting Japan, China, and the northern portions of India during the cold season. The range of this species appears to be confined to the Palearctic region, for reliance cannot be placed upon Audubon's statement that he had obtained a solitary female in 1817 on Lake Barataria—suggestive name—near New Orleans; no subsequent observer having found a trace of this bird in any part of America.

As already mentioned, the late Mr. Wolley was the first to dissipate the obscurity which enveloped the breeding-habits of the Smew, and a full account of his discovery was published in 'The Ibis' for 1859, pp. 69–76. As the volume has long been out of print, the Editor considers it desirable to quote from this interesting account at considerable length:—

"The first year I was in Lapland, 1853, it was important for me to find out the native, that is, the Finnish, names for the birds of the country. Of the Ducks generally I soon learnt to understand to which species each name referred; but there was one called *Ungĭlo*, concerning which I was for a long time in the dark. It was described as breeding in the holes of trees, or in *tyllas*, that is, nest-boxes. It was a smaller bird than the *Sotka* (Golden-eye), but was able to turn that bird out of its hole, if it wanted it for itself; though some accounts told the reverse story. It had formerly been found not unfrequently on the Muonio river, and especially on the lakes through which the little Jeris-joki runs. On the former river, a little above the inlet of the Palo-joki, there is even an islet called after it, Ungilon-saari, on which, though there are still *tyllas*, the bird has not been known for a good many years. In the course of time I learned that the bird had a beak like a *Koskilo* (Merganser); and the colours of the male were described to me in a way that left no doubt it was the Smew. Still it required some selection of evidence to hold the opinion firmly; for instance, a woman talking to me imitated the cry of the bird, in doing which she used the syllables 'u-u-ungel' with the music of the spring call of the Long-tailed Duck, and by her subsequent description clearly showed that that was the bird she meant, though it is usually known by quite another name, identical with, and perhaps borrowed from, the Swedish, *Alle*. This suggested to me that the name *Ungilo* may have been originally applied to the Long-tailed Duck, inasmuch as we find, in Ström's 'Description of Sandmör,' that the Long-tailed Duck is called *Angle-mager* (Hook-maker) on parts of the Norwegian coast, doubtless from its cry, connected with the time of its appearance, when the sea-fishing begins. Nothing is more common than one and the same name being applied to different birds in different districts. Even this very name *Ungilo* is used for the Goosander in certain places on the Upper Torneå river.

"Concerning the egg of *Ungilo* I made every inquiry. All the people who remembered it on the Muonio agreed that it was much less than the Golden-eye's, and was liable to be found in the same hole with eggs of that bird. As a consequence of this popular belief, I often had dwarf eggs of *Sotka* brought to me for *Ungilo's*. From one trustworthy man, Piko Haki, I heard that some ten years before he had found a nest and taken the eggs on sale for eating to a resident trader, who had asked him where he had got Hens' eggs. Now Hens' eggs are unknown in the interior of the country, where I was; but at Uleåborg, where the trader had been familiar with them, they are about the size of our Bantam's eggs. This gave me the best indication I had yet met with of the probable appearance of the egg; and I told my servant-lad Ludwig in confidence that, when we at length should get *Ungilo's* eggs, they would be very like Wigeon's, though probably more white. Of course this was not to be talked of, as it might lead to attempts at imposition. It is possible that the small comparative size of the *Ungilo's* eggs, and the habit of the bird turning out the Golden-eye, had made it little liked by the people, and that they used to catch it on the eggs and kill it, as they do Hawk Owls and Tengmalm's Owls.

"In 1857 the clergyman of Muonioniska, Priest Liljeblad, had been transferred to Sodankyla; and in the spring of this year an intelligent young man, Carl Leppajervi, went from Muonioniska to be assistant schoolmaster with his former teacher. I gave Carl strict charge to make every inquiry for *Ungilo* in that part of the world and of travellers from Kemi Trask. One day (the 30th July, 1857), as I passed by the homestead of Regina's Calle, the famous steerer of the Muonio Falls, there was given to me a wooden box, such as is used in the country for carrying butter on a journey, addressed 'To the English gentleman Joh Woleg in Muoniovaara.' The box was not tied nor secured in any way; and on the lid being opened, there first appeared a well-written Finnish letter, of parts of which the following is an exact translation:—

"'Matthias Lasko of Made-koski-kyla, on the Kitinen-joki, five miles [Swedish] from Sodankyla, has found on the Liesi-joki eggs of Uinilo, and has brought to me three eggs, on which is written a number like this.' [Here follows a facsimile of the figure 1 on the eggs. It appears from Hermelin's map, that the Kitinen-joki, of which the Liesi is doubtless a tributary, runs into the Kemi-joki a little north of Sodankyla.] 'They were found on the 8th day of the Summer-month [June] 1857. Of an old birch-trunk the wood was rotted away, and it was left hollow, forming a hole in which they were.' [The expression used involves the idea of the trunk being still standing.] 'There were two men in company; and the other man has given four eggs to the priest: there were seven of them; but there was no down brought. . . . . The Uinilo was also killed; and with the eggs it too is sent.—Carl Leppajervi. First day of the Hay-month [July] 1857. This Uinilo was taken to the priest, and he wants for it 20 copecks.'

"The next, or probably the first thing in the box that struck my eye, was a stiff-necked skin of a female Smew, with hatching spots on its underside; then I came to five or six much-injured eggs of Greenshank and other birds; and lastly, at the bottom of all, well-wrapped in tow, were the three Smew's, blown each with two holes, which I afterwards found it safe to round off with a drill. The eggs rather staggered me at first sight, they were so like Wigeon's. From time to time I held consultations over them. On comparing them with a series of something like fifty Wigeon's eggs, I found that they were pretty nearly of the same size, though rather below the average. They were flattened at the small end more than any of the Wigeon's, and they had less of the yellowish tinge about them, so that persons not much used to eggs could pick them out of the lot; but all these peculiarities might be accidental, though it seemed remarkable that any woodsman trying to pass off Wigeon's eggs for Smew's should have been able to find so abnormal a nest. But it was not very long before I satisfied myself that there was a decided difference of texture. This could be perceived on an ordinary examination ; but it became very striking on exposing the egg to direct sunshine and examining the penumbra, or space between full light and full shadow, with a magnifying glass—the sharp '*mountainous*' structure of the Wigeon's egg was strongly contrasted with the lower and more rounded character of the elevations in the Smew's. It is my intention to endeavour to illustrate this with the help of photography. Further, I tried the sense of touch : scratching the egg with the most sensitive of my finger-nails I could at once perceive the greater roughness of the Wigeon's. Ludwig, though his hand was by no means of the finest, did not make a single mistake in some ten trials with his eyes shut of various Wigeon's eggs and with the supposed Smew's ; and one or two other people were equally successful. I now felt no doubt that I had true eggs of the Smew. The ivory-like texture of the Goosander's egg was a pretty parallel to the character of the Smew's.

"In the mean time, on August 4th, I sent a letter to Pastor Liljeblad, enclosing money, amongst other uses to pay for a thoroughly trustworthy man to travel to Madekoski-kyla, to inquire into the particulars of the capture of the Smew and its eggs, to himself visit the birch-trunk, and to bring away the down which would be lying at the bottom of the hole. I also wrote to Carl Leppajervi. I was obliged to leave Muoniovaara for England on the 11th of September. I had not been very long in England when I received a letter enclosing communications from Pastor Liljeblad and from Carl Leppajervi, which had arrived at Muoniovaara on the 16th of September, and also enclosing a specimen of the down, which my agent had picked out of the heap of touch-wood sent with the letters from Sodankyla.

"The priest told me in Swedish that he now sent me the four *Uinilo's* eggs, which had been brought to him. He added, in answer to a question of mine, 'I think that the men who came with them, if not exactly of the best behaved sort, are at least so far to be trusted that they brought the true ones. Kalle went at once to Made-koski.' Kalle's letter said in Finnish, 'I have been to Made-koski for the Uinilo's down; but there was not much of it there. The birch-stump was open at the top; and who knows but the wind may have carried some of the down away? Matthias Lasko took away a little from what I have sent, to see if he could make out himself that it was Uinilo's. That Uinilo was caught actually from the top of those eggs; indeed it is true. . . . . I saw that in that birch-stump there had at some other time been eggs; for there were old pieces of egg-shell. Written 29th of Harvest-month (August) 1857.—Karl Leppajervi.'

"I was told by my man in Lapland that these four eggs had been blown with only one hole, sufficiently well made, but that a great part of the yolk had been left inside. They were also stained outside; but he had cleaned them out, rounded the holes with a drill, and made a good job of them. The down sent to me I found to agree generally with that on the body of the female Smew; but I did not make a careful examination, and I have not yet made it.

"At the end of October 1858 I received these other four eggs. I found that the character which I had previously observed, but which I had originally seen on only one of the first three, was common to all the other four, namely, that shown by the presence of a thin calcareous covering outside the egg-shell proper, apparently of the same nature as that which is so conspicuous in the egg of the common tame Swan. Some attempts had been made in Sodankyla, as my man told me, to scrape this off.

"It is worthy of note, that the very pale colour of the down of the Smew seems to be connected with its choosing holes for breeding. No bird of the duck kind that has white down, as far as I know, places its eggs in an exposed situation. The Goosander, Golden-eye, Sheldrake, birds differing much from one another, have all white down, and all lay their eggs in holes of trees when such are to be found, whilst one of them at least has well-coloured eggs."*

Since Wolley's discovery, Messrs. Seebohm and Harvie-Brown have obtained authenticated eggs of the Smew at Habariki, on the Petchora; and, as before remarked, our knowledge of its breeding-range is far more extensive. The average measurements of the eggs are 2 by 1·45 in.

Smews are shy and vigilant, taking long flights occasionally and swimming away rapidly on the approach of a boat. They feed on small fish, crustacea, and aquatic insects, which they obtain without difficulty as they are excellent divers, pursuing their prey under water with great rapidity, but when walking they appear to labour in their progression, from the backward position of their legs. Mr. J. H. Gurney, jun., found a frog in the gullet of a bird purchased in Leadenhall Market in January 1867.

In the adult male the bill is one inch and a half long, and of a bluish-lead colour, the nail horny and white; the irides reddish-brown; at the base of the bill on each side, a black patch, which just surrounds the eye; from the crown of the head down the line of the occiput, another dark patch elongated, which is tinged with green, the dark feathers mixed with others that are white, and all somewhat elongated, forming a crest; the other parts of the head, the chin, and all the neck white; the back black; rump, upper tail-coverts, and tail-feathers, ash-grey; the point of the wing greyish-black, with two crescentic lines of black pointing forward, one before and one behind the point of the wing; the small wing-coverts and scapulars white, the latter edged with black; great coverts and secondaries black, tipped with white, forming two narrow white bands; the primaries nearly black; inner secondaries ash-grey, passing to lead grey, the inner feathers being the darkest in colour; all the under surface of the body pure white; the sides under the wing and the flanks barred with narrow ash-grey lines; legs, toes, and their membranes bluish- and lead-grey. The whole length is seventeen inches and a half: the wing, from the carpal joint to the end of the longest quill-feather, seven inches and three-quarters.

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* To this list may be added the Harlequin Duck, which nests in holes and has white down.—[Ed.]

An adult male, which belonged to the Ornithological Society of London, lived more than two years on the lake in St. James's Park, assumed the colours of the plumage of the adult female before the middle of June, remaining in that state during the summer, and reassuming his white plumage at the regular autumn moult. This bird associated only with a female Golden-eye.

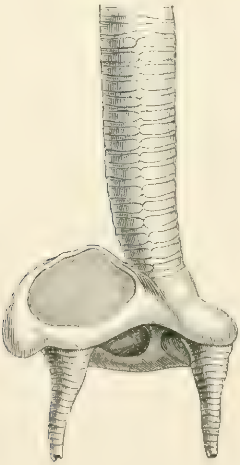
Adult females have the bill and the irides of the same colours as those of the males, with a black patch at the base of the upper mandible; all the top of the head reddish-brown; down the back of the neck a streak of ash-grey, which extends to form a collar at the bottom, and spreads thence over the space before the wings and on the upper part of the back; centre of the back, the rump, upper tail-coverts, and tail-feathers greyish-black: point of the wing ash-grey; smaller wing-coverts pure white; greater coverts and secondaries black, tipped with white as in the male, but the two white bands are narrower; primaries nearly black; inner secondaries lead-grey; chin, throat, and all the under surface of the body, pure white; legs, toes and their membranes, lead-grey. Females are considerably smaller than males, measuring but fourteen inches and a half in their whole length, and but six inches and a half from the point of the wing to the end of the longest quill-feather.

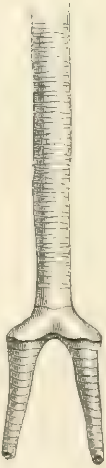
Young males resemble females for the first twelve months, and do not assume their white plumage till their second autumn moult. Young females have no black patch on the side of the head during their first winter; the red colour on the back of the neck covers a larger space; the white colour of the smaller wing-coverts is mixed with ash-grey, and the under surface of the body is of a dull white. Females probably assume the black patch on the lore, and the more pure white colour on the wing-coverts, at the second autumn moult.

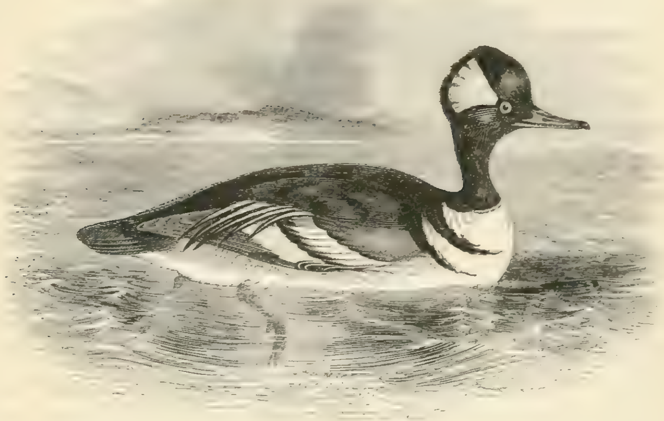
The nestling which is figured by Mr. Dresser in his 'Birds of Europe' is described, from specimens obtained at Kimschenk, Russia, on the 18th June as :—

Upper parts, including the sides of the head below the eye, but only the back of the neck, dark blackish-brown, darkest on the crown and the lower part of the back; at the base of the wing-joint a white spot, and another close to it, but rather lower down the back, and on each side of the rump another white spot; below the eye a very small white spot; under parts white; breast and flanks pale greyish- or sooty-brown. One young bird, which can only be two or three days old, has the bill so slightly serrated that the serrations can only be seen when very closely looked into; but another, which is a few days older, has the serrations very distinct.

A portion of the trachea of the male Smew is represented below on the left hand. The figure on the right is from the lower portion of the windpipe of the female.







MERGUS CUCULLATUS, Linnæus.*

THE HOODED MERGANSER.

Mergus cucullatus.

WE are indebted to Selby for the first notice of the Hooded Merganser as a straggler to Britain; the skin of a female bird said to have been obtained at Yarmouth, in Norfolk, during the winter of 1829, having been sent to Selby by Mr. Elton, of Redland, Bristol. The occurrence was recorded in the Transactions of the Natural History of Northumberland, Durham, and Newcastle-upon-Tyne, vol. i. p. 292, and also in the third volume of the Edinburgh Journal of Natural and Geographical Science, page 238, by Selby, who was informed that other instances of the capture of birds of this species had occurred. A note by Prof. Newton in the 'Transactions of the Norfolk and Norwich Naturalists' Society,' ii. p. 408, tends, however, to cast a doubt upon the supposition that this example was really killed in British waters. The late Mr.

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* Syst. Nat. Ed. 12, i. p. 207 (1766).

Blyth wrote in 1838, in 'The Naturalist,' vol. iii. p. 413:—"Mr. Hoy informs me that a beautiful male Hooded Merganser, in thoroughly mature plumage, has been secured in the county of Norfolk; being the first known instance of this bird occurring in its adult garb in Britain."

The late Mr. T. C. Eyton has described and figured in his 'History of the Rarer British Birds' (p. 75), a bird of this species obtained by himself in the Menai Straits in the winter of 1830–31. The Author heard of an example in the collection of Mr. Anthony Ralph Biddulph, of Burton Park, Petworth, Sussex, said to have been shot near that place; but Mr. A. E. Knox makes no mention of it in his standard work on the Birds of Sussex. According to Gould, the collection of Mr. W. Christy Horsfall, of Horsforth-Low Hall, near Leeds, contained a pair said to have been shot in the vicinity; but Mr. W. Eagle Clarke states that he is unable to trace these specimens. Mr. Gervase F. Mathew, R.N., states (Zool. s.s. p. 2182) that a friend shot a "magnificent pair of Hooded Mergansers, the male being in splendid plumage," near Sheerness in March 1870.*

As regards Scotland, in the late Mr. Sinclair's Catalogue of the Birds of Caithness, published in 1841, mention is made of a specimen, which, according to Mr. R. Gray, is still in the collection formed by that gentleman, and now at Thurso. The late Mr. John Colquhoun, in his 'Sporting Days' (p. 20), has described his observation of three Hooded Mergansers in the Firth of Forth on the 5th of May, 1853.

Ireland, however, as might be expected from its position, affords the most numerous as well as the best authenticated instances of the visits of this American species. An example obtained by Dr. Chute about the year 1840 at Dingle Bay, co. Kerry, is at Chute Hall, Tralee; and Watters has stated, on the authority of Mr. Glennon, a bird-stuffer of Dublin, that an immature female, shot near Knockdrin Castle, co. Meath, was in the collection of Sir R. Levinge,

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* The bald insertion of this species in a mere catalogue entitled 'The Somersetshire Fauna,' by Mr. W. Baker (Somerset. Archæol. Proc. p. 146), is, like many similar records, unworthy of consideration.

Bart. In his 'Fowler in Ireland' (p. 121), Sir R. Payne-Gallwey says that he has had the good fortune to secure no less than three. One pair was procured in the severe frost of December 1878, in Cork Harbour, where they haunted a creek in company with some Red-breasted Mergansers; but though he had ample chances of observing their motions, feeding and flying, through a glass, they were too wild to get within range of, until one day when he found them deserted by their companions. He killed the third bird during the yet more severe weather of January 1881, on the north coast of Kerry; and he heard of a solitary individual being shot near Sligo the same winter, but he believes it was not preserved. From what he saw of those he shot, they appeared to fly faster and with a more darting motion than other Mergansers, though diving with equal facility: but on one occasion a crippled Hooded Merganser made no effort to dive, but swam low in the water like a wounded Teal, with the crest laid flat and smooth; the head looking small and black, very different to its usually handsome and bushy aspect.

There is no authenticated instance of the occurrence of the Hooded Merganser on the continental coast of Europe, nor, so far as the Editor can discover, in Greenland, to which it is stated by the authors of 'The Water Birds of North America' to be an occasional visitor. In winter it straggles to Mexico, Cuba, and the Bermudas; it is abundant in the Carolinas, which form the southern limit of its breeding-range; and northward it is found in suitable localities throughout North America up to the St. Lawrence on the east, and Alaska on the west. Through the Fur Countries it is numerous and generally distributed, within the limits of forest growth.

So far as our present knowledge goes, the Hooded Merganser invariably makes its nest in the hollows of trees, lining it with down, which, according to Mr. G. A. Boardman, as quoted in the above-mentioned 'Water Birds,' is dark-coloured: not white, as the down of birds which nest in holes usually is. The eggs, from five to eight in number, are of a pure ivory-white, and of an oval or almost globular form; average measurements 2·1 by 1·7 in.

Audubon writes as follows:—"Excepting the Smew, or White Nun, the Hooded Merganser is the handsomest of its family. Its broad and rounded crest of pure white, with an edging of jetty black, and which it closes or spreads out at pleasure, renders the male of this species conspicuous on the waters to which it resorts. The activity of its motions, the rapidity of its flight, and its other habits, contribute to render it a pleasing object to the student of nature, not less than to the sportsman. Its flesh, however, has a fishy taste and odour, although it is relished by some persons. It seems to prefer fresh water, and is by no means very frequent along the sea-coast. Long, narrow, and moderately deep creeks, or small ponds, are more frequented by it than large rivers or lakes. On the waters of the western and southern States, these Mergansers are seen to arrive from the north early in October, but, generally, later than many species of Ducks, although sooner than either the Red-breasted Merganser or the Goosander. At the approach of night, a person standing still on the banks of a river, as the Ohio, first hears the well-known sound of wings whistling through the air; presently after, a different noise, as if produced by an Eagle stooping on her prey, when, gliding downwards with the rapidity of an arrow, he dimly perceives the Hooded Mergansers sweeping past. Five or six, perhaps ten, there are; with quick beats of their pinions, they fly low over the waters in wide circles. Now they have spied the entrance of a creek; they shoot into it, and in a few seconds you hear the rushing noise which they make, as they alight on the bosom of the still pool. Up the creek they proceed, washing their bodies by short plunges, and splashing the water about them. Now they dive for minnows, which they find in abundance, and which no doubt prove delicious food to the hungry travellers. At length, having satisfied their appetite, they rise on wing, fly low over the creek with almost incredible velocity, return to the broad stream, rove along its margin until they meet with a clean sand-beach, where they alight, and where, secure from danger, they repose until the return of day. This bird ranges throughout the United States during winter, content with the food it meets with in the bays and estuaries of the eastern coast, and on the inland streams. The dam of the Pennsylvania miller is as agreeable to it as that of the Carolina rice-planter; even the numerous streams and pools of the interior of the Floridas are resorted to by this species, and there I have found them full of life and gaiety, as well as on the Missouri, and on our great lakes. When the weather proves too cold for them they go southwards, many of them removing towards Mexico."

"The Hooded Mergansers that remain with us nestle in the same kind of holes or hollows as the Wood Ducks; at least I have found their nests in such situations seven or eight times, although I never saw one of them alight on the branch of a tree, as the birds just mentioned are wont to do. They dive, as it were, directly into their wooden burrows, where, on a few dried weeds and feathers of different kinds, with a small quantity of down from the breast of the female, the eggs are deposited. The young, like those of the Wood Duck, are conveyed to the water by their mother, who carries them gently in her bill; for the male takes no part in providing for his offspring, but abandons his mate as soon as incubation has commenced. The affectionate mother leads her young among the tall rank grasses which fill the shallow pools, or the borders of creeks, and teaches them to procure snails, tadpoles, and insects. On two occasions the parents would not abandon the young, although I expected that the noises which I made would have induced them to do so; they both followed their offspring into the net which I had set for them. The young all died in two days, when I restored the old birds to liberty."

"The Hooded Mergansers which leave the United States take their departure from the 1st of March to the middle of May; and I am induced to believe that, probably, one-third of them tarry for the purpose of breeding on the margins of several of our great lakes. When migrating, they fly at a great height, in small loose flocks, without any regard to order. Their notes consist of a kind of rough grunt, variously modulated, but by no means musical, and resembling the syllables *croo, croo, crooh*. The female repeats it six or seven times in succession, when she sees her young in danger. The same noise is made by the male, either when courting on the water, or as he passes on wing near the hole where the female is laying one of her eggs."*

In the adult male the bill is black; the irides bright yellow; head and upper part of the neck black; top of the head ornamented with a semi-circular crest, the posterior half of which is white edged with black; back and wing-coverts black; primaries, secondaries, rump, and tail-feathers dark brown; scapulars and inner secondaries elongated, slender, and white, edged with black; lower part of neck in front white, with the points of two crescentic bands descending from the upper part of the back, and directed forwards; belly, vent and under tail-coverts white; sides waved with yellowish-brown; legs and feet dull red. The whole length of the bird is nineteen inches; the wing, from the point to the end of the longest quill-feather, seven inches and a half.

The female is rather smaller in size; the head, neck, back, and wings dark brown; top of the head reddish-brown, the feathers elongated; chin white; neck in front pale brown, the edges of the feathers lighter in colour; under parts white; bill, irides, and feet, as in the males. The female measures seventeen inches and a half in her whole length; the wing from the point seven inches.

The young birds resemble the female for the first year; during the second the black and white about the head appears in young males; in the third spring they are complete.

In the downy nestling, the crown is buffish-brown; upper parts umber-brown with a few grey streaks; sides of neck buff; under parts greyish-white, with a brownish band across the chest; upper mandible black with a yellowish tip; under mandible pale yellow.

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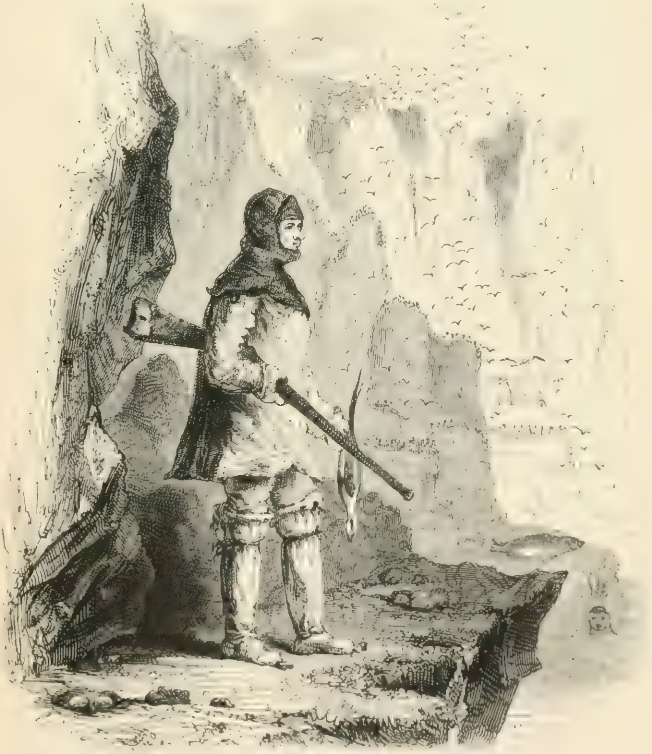
* As this long extract was given in former Editions, it is continued in the present one; with the exception of Audubon's description of the eggs, which is obviously erroneous.—[Ed.]

The final vignette represents an Englishman in Iceland, in the dress worn when collecting birds, taken from a drawing lent to the Author by the late Mr. W. Proctor of Durham, of whom it is a fair likeness.



THE END.

AMERICAN MUSEUM
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